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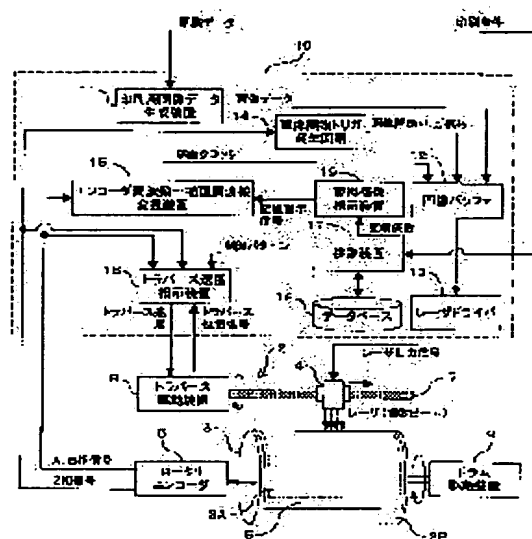
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(54) PLATE MAKING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a printing plate which permits easy inter-color registering corresponding to the fan-out of printing forms as to a plate making device applied to a CTP system.

SOLUTION: An external surface drum type plate making device which selectively writes a dot pattern to a plate surface part 3A provided on the outer peripheral surface of a drum 3 according to digital data of a sample pattern, while making a horizontal scan by the rotation of the drum 3 and a vertical scan by the movement of a writing device 4 along the axis of the drum controls the moving speed of the writing device 4 to the rotating speed of the drum 3 according to print conditions.



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CLAIMS

[Claim(s)]

[Claim 1] The drum which performs horizontal scanning by rotation while being platemaking equipment which engraves the version for printing for printing a pattern to a print sheet and having the printing plate section on a peripheral face, The write-in equipment which is arranged towards the peripheral face of this drum and writes the dot pattern of a pattern in this printing plate section alternatively based on the digital data of a sample pattern, Platemaking equipment characterized by having the passing speed control means which controls the passing speed of the migration equipment which performs vertical scanning by moving this write-in equipment to the shaft and parallel direction of this drum, and this write-in equipment to the rotational speed of this drum according to printing conditions.

[Claim 2] An input means to input printing conditions, and the database which memorized the control pattern of the passing speed of this write-in equipment by this passing speed control means for every printing conditions according to the fan-out to the cross direction of this print sheet, It is platemaking equipment according to claim 1 which is equipped with a retrieval means to search the control pattern according to the printing conditions inputted through this input means from this database, and is characterized by this passing speed control means controlling the passing speed of this write-in equipment based on the control pattern searched with this retrieval means.

[Claim 3] The drum which performs horizontal scanning by rotation while being platemaking equipment which engraves the version for printing for printing a pattern to a print sheet and having the printing plate section on a peripheral face, The write-in equipment which is arranged towards the peripheral face of this drum and writes the dot pattern of a pattern in this printing plate section alternatively based on the digital data of a sample pattern, The migration equipment which performs vertical scanning by moving this write-in equipment to the shaft and parallel direction of this drum, Platemaking equipment characterized by having the writing speed control means which controls the writing speed of this write-in equipment to the rotational speed of this drum according to printing conditions, and the passing speed control means which is synchronized with the writing speed of this write-in equipment, and controls the passing speed of this write-in equipment to the rotational speed of this drum.

[Claim 4] An input means to input printing conditions, and the database which memorized the control pattern of the writing speed of this write-in equipment by this writing speed control means for every printing conditions according to the fan-out to the lengthwise direction of this print sheet, It is platemaking equipment according to claim 3 which is equipped with a retrieval means to search the control pattern according to the printing conditions inputted through this input means from this database, and is characterized by this writing speed control means controlling the writing speed of this write-in equipment based on the control pattern searched with this retrieval means.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the platemaking equipment of the method (the so-called outside drum method) which writes in a pattern to the printing plate with which the peripheral face of a drum was equipped especially about the platemaking equipment which creates the version for printing based on the digital data of a sample pattern.

[0002]

[Description of the Prior Art] In recent years, digitization of a platemaking process is advanced and a workflow called CPT (Computer to Plate) which creates the version for printing directly based on the digital data (image data) which digitized the sample pattern is established. According to the system (henceforth a CPT system) using this workflow, since it is not necessary to create the film used as the block copy, reduction of cost can be aimed at and there is an advantage that a sample pattern is faithfully reproducible with a high location precision.

[0003] As platemaking equipment applied to such a CPT system, the so-called platemaking equipment of an outside drum method as shown in drawing 9 (a) is known. This platemaking equipment arranges the write-in equipments 4, such as laser, in a peripheral face towards the drum 3 equipped with the raw version (version with which the pattern is not written in). Making an one direction carry out high-speed rotation of the drum 3 with constant speed, and moving write-in equipment 4 to the shaft orientations of a drum 3 with constant speed by the traverser 2 By irradiating a laser beam towards the peripheral face on a drum 3 based on image data from write-in equipment 4, a pattern is written in the printing plate section (field of a pattern where it is equipped with the raw version and which can be written in) of a drum 3.

[0004] With this platemaking equipment, the hand of cut of a drum 3 turns into a main scanning direction, the migration direction of the write-in equipment 4 by the traverser 2 becomes in the direction of vertical scanning, and as shown in drawing 9 (b), a pattern is written in the printing plate section on the raw version 5 in the direction of slant in the shape of a spiral. The pattern written in the printing plate section serves as the same scale as a sample pattern in principle [reappearing-as faithfully as possible] for a sample pattern. In addition, a printing machine may be on board to the platemaking equipment of this method, the on-board platemaking printing machine which engraves directly may also be contained in it, and especially CPT may be read with Computer to Press in this case.

[0005]

[Problem(s) to be Solved by the Invention] By the way, it is known for the printing machine, for example, a sheet printing machine, that the fan-out phenomenon in which the dimension of a print sheet spreads will arise with the ununiformity of the content moisture of a print sheet (sheet) or front-face nature by use of dampening water. Generally a print sheet adds this fan-out phenomenon, it will be remarkable to a hips side, a print sheet will add, and a hips side will spread in a flabellate form.

[0006] And in the sheet printing machine of a multi-printing station mold, in order to convey making it deliver to the next printing station one by one through a middle drum holding the tip of a print sheet by the pawl of an impression cylinder, the amount of fan-outs for every station changes with maintenance situations in the pressure and the pawl by each drum. The hips of a print sheet spread gradually in order as are shown in drawing 10 and it specifically progresses with 1st station 1C, 2nd station 2C, 3rd station 3C, and 4th station 4C. This is the same also at the rotary press for newspapers, and a band-like print sheet (newsprint) spreads crosswise [right-and-left] as it goes down-stream.

[0007] As mentioned above, with the platemaking equipment in the conventional CPT system, since it is considering as the reproducing-as faithfully as possible-sample pattern principle, although the amounts of fan-outs differ for every printing station, a pattern is altogether written in by the same scale. For this reason, the pattern of each color printed the whole printing station brings a result from which the aim between colors shifts by each fan-out.

[0008] in order to amend a gap of the aim between these colors -- the former -- a fan-out -- although the hips side of a lithographic plate is extended using vice and he is trying to double the aim between colors, when right-and-left width of face is 900mm, it extends, and since there are very few amounts as 200-micrometer [a maximum of] order, ***** corresponding to the amount of fan-outs has the technical problem that the adjustment takes skill. moreover -- although there is a thing of the format that the printing plate section is formed in the peripheral face of a printing cylinder itself, and a direct pattern is written in the peripheral face of a printing cylinder, in an on-board platemaking printing machine -- in this case -- a fan-out -- vice -- the very thing cannot be used.

[0009] It is originated in view of such a technical problem, and this invention aims at offering the platemaking equipment which made it possible to obtain the version for printing with which it can be made to be able to respond to the fan-out of a print sheet in a CPT system, and the aim between colors can be doubled easily.

[0010]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the platemaking equipment of this invention The drum which performs horizontal scanning by rotation while having the printing plate section on a peripheral face. The write-in equipment which is arranged towards the peripheral face of this drum and writes in the dot pattern of a pattern alternatively on this printing plate section based on the digital data of a sample pattern. The migration equipment which performs vertical scanning by moving this write-in equipment to the shaft and parallel direction of this drum. It is characterized by having the passing speed control means which controls the passing speed of this write-in equipment to the rotational speed of this drum according to printing conditions (location on printing Rhine of a paper type, printing pressure, and a corresponding printing station etc.). It becomes possible to make by this the pattern drawn by this printing plate section correspond to the fan-out of a print

sheet, and to make arbitration deform crosswise [right-and-left] to a sample pattern.

[0011] In this case, the thing of various write-in methods is applied according to the creation method of versions for printing, such as what exposes the photosensitive printing plate section with beams of light, such as a laser beam, as write-in equipment, and writes in a pattern pattern, and a thing which the drop of a plate is made to adhere to the printing plate section, and writes in a pattern pattern. Moreover, this printing plate section is a field which serves as a version for printing by writing in a pattern, and when twist the raw version, and it fixes on the peripheral face of this drum and also above platemaking equipment is constituted as an on-board platemaking printing machine, it may use the peripheral face of the printing cylinder applicable to this drum itself as the printing plate section.

[0012] Preferably, the control pattern of the passing speed of this write-in equipment by this passing speed control means is memorized for every printing conditions according to the fan-out of the cross direction of a print sheet in the database, the control pattern according to the printing conditions inputted through the input means is searched from this database with a retrieval means, and the passing speed of this write-in equipment is controlled based on the searched control pattern.

[0013] Moreover, in above platemaking equipment, the passing speed of this write-in equipment is made to increase as this write-in equipment advances in the center from the shaft-orientations start edge side of this drum, and control by this passing speed control means may be performed so that the passing speed of this write-in equipment may be decreased, as this write-in equipment progresses to a termination side from the center of shaft orientations of this drum. Thereby, the pattern especially expanded crosswise [right-and-left] crosswise [right-and-left] in near the center of this printing plate section to the sample pattern is drawn by this printing plate section. In this case, the velocity error over the passing speed in the center of shaft orientations of this drum is more preferably set as the symmetry by the shaft-orientations start edge and termination side. Thereby, the pattern symmetrically transformed crosswise [right-and-left] from the center of this printing plate section is drawn by this printing plate section.

[0014] Furthermore, it sets to above platemaking equipment and you may make it control the passing speed of this write-in equipment on the non-printing plate section (parts other than the printing plate section among the peripheral faces of this drum) of this drum by this passing speed control means according to the passing speed of this write-in equipment on this printing plate section so that each write-in starting position for every rotation period of this drum on this printing plate section becomes the same spacing. Thereby, the thing with few fan-outs which you add and is made in agreement [the right-and-left width of face of a pattern] with the right-and-left width of face of a sample pattern about a head side becomes possible the tip side of this printing plate section.

[0015] In this case, preferably, control by this passing speed control means is performed so that the passing speed of this write-in equipment on this printing plate section may be made to increase, as this write-in equipment progresses to a termination side from the shaft-orientations start edge side of this drum. It becomes possible to draw the pattern which deformed into the trapezoid with which it added to this printing plate section to the sample pattern, and the hips side was expanded crosswise [right-and-left] by this. Moreover, the absolute value of the velocity error over the passing speed in the center of shaft orientations of this drum on this printing plate section is more preferably set as the symmetry by the shaft-orientations start edge and termination side in this case. Thereby, the pattern of symmetrical trapezoidal shape is drawn crosswise [right-and-left] from the center of this printing plate section at this printing plate section.

[0016] In order to attain the above-mentioned purpose, moreover, another platemaking equipment (2nd platemaking equipment) of this invention The drum which performs horizontal scanning by rotation while having the printing plate section on a peripheral face. The write-in equipment which is arranged towards the peripheral face of this drum and writes in the dot pattern of a pattern alternatively on this printing plate section based on the digital data of a sample pattern, The migration equipment which performs vertical scanning by moving this write-in equipment to the shaft and parallel direction of this drum, The writing speed control means which controls the writing speed of this write-in equipment to the rotational speed of this drum according to printing conditions (location on printing Rhine of a paper type, printing pressure, and a corresponding printing station etc.), It is characterized by having the passing speed control means which is synchronized with the writing speed of this write-in equipment, and controls the passing speed of this write-in equipment to the rotational speed of this drum. It becomes possible to make by this the pattern drawn by this printing plate section correspond to the fan-out of a print sheet, and to make arbitration deform into a lengthwise direction (hoop direction of this drum) to a sample pattern.

[0017] Preferably, the control pattern of the writing speed of this write-in equipment by this writing speed control means is memorized for every printing conditions according to the fan-out to the lengthwise direction of this print sheet in the database, the control pattern according to the printing conditions inputted through the input means is searched from this database with a retrieval means, and the writing speed of this write-in equipment is controlled based on the searched control pattern.

[0018]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing. First, drawing 1 - drawing 4 show the platemaking equipment concerning the 1st operation gestalt of this invention. As shown in drawing 1, the platemaking equipment concerning this operation gestalt is platemaking equipment of an outside drum method, and is equipped with the write-in equipment 4 arranged by the peripheral face as usual towards the peripheral face of the drum 3 equipped with the raw version 5, and a drum 3, and the traverser (migration means) 2 which moves write-in equipment 4 to the shaft orientations of a drum 3.

[0019] The drum driving gear 9 and the rotary encoder 6 are attached in the revolving shaft of a drum 3. The drum driving gear 9 makes an one direction carry out high-speed rotation of the drum 3 with constant speed. Moreover, a rotary encoder 6 outputs a pulse signal synchronizing with rotation of a drum 3. A and a B phase signal are used for detection of the rotational speed (rotational frequency) of a drum 3 among the pulse signals outputted from a rotary encoder 6, and Z phase signal is used for detection of the zero point. Moreover, the rotation phase of a drum 3 is correctly detectable with A, B, and Z phase signal.

[0020] The traverser 2 consists of a screw rod 7 which it is arranged in the shaft of a drum 3, and parallel, and is screwed in write-in equipment 4, and a traverse driving gear 8 made to rotate the screw rod 7. Migration to the shaft orientations of the drum 3 of write-in equipment 4 is realized by rotation of the screw rod 7 by the traverse driving gear 8. The traverse driving gear 8 is equipped with the rotary encoder which is not illustrated, and the location of the write-in equipment 4 in the screw rod 7 is detected by the rotational frequency and rotation phase angle of this rotary encoder.

[0021] Moreover, write-in equipment 4 is constituted as laser write-in equipment of the method which exposes alternatively printing plate section (field of pattern which can be written in) 3A on the unexposed raw version 5 by the exposure of laser, and writes in a pattern pattern (dot pattern which constitutes a pattern). The interior of write-in equipment 4 is equipped with two or more semiconductor laser transmitters, and it is possible to obtain the dot pattern of two or more points at once. The passing

speed to the exposure timing (namely, write-in timing of the pattern to printing plate section 3A) of the laser by write-in equipment 4 and the shaft orientations of the write-in equipment 4 by the traverse driving gear 8 is controlled by this operation gestalt with the control unit 10 explained below.

[0022] The control device 10 consists of the image data generation equipment 11 for printing, the image buffer 12, a laser driver 13, the image initiation trigger generator 14, the encoder frequency-drawing frequency converter 15, the traverse rate designating device 16, retrieval equipment 17, a database 18, and a transform coefficient designating device 19. First, explanation of control of the exposure timing of the laser by write-in equipment 4 performs this control using the image data generation equipment 11 for printing, the image buffer 12, a laser driver 13, the image initiation trigger generator 14, the encoder frequency-drawing power converter 15, and the transform coefficient designating device 19.

[0023] The image data generation equipment 11 for printing is equipment which generates the image data for printing (digital data of a sample pattern) from the manuscript data of each color incorporated from upstream software development. The text data (manuscript data) which included the image which RIP (Raster Image Processor) is used as image data generation equipment 11 for printing here, and was specifically described by this RIP by the Page Description Language, the alphabetic character, and the graphic form is changed into bit data (image data). The image data generated with the image data generation equipment 11 for printing is stored in the image buffer 12.

[0024] The image data stored in the image buffer 12 is serially transmitted to a laser driver 13 based on the drawing clock signal by the encoder frequency-drawing frequency converter 15 considering the image initiation trigger signal from the image initiation trigger generator 14 as transmitting initiation timing for every one-revolution period of a drum 3. A laser driver 13 takes the image data and synchronization which were transmitted from the image buffer 12, and outputs a laser output signal to each laser transmitter in write-in equipment 4. And in response to the input of the laser output signal from this laser driver 13, laser is turned to the raw version 5 and each laser transmitter in write-in equipment 4 irradiates it.

[0025] In addition, the image initiation trigger generator 14 detects the zero point of the phase of a drum 3 from Z phase signal from a rotary encoder 6, and is generating the image initiation trigger signal. The phase of each write-in starting position for every rotation period on a drum 3 is made to correspond to the zero point here. Moreover, from A from a rotary encoder 6, and a B phase signal, the encoder frequency-drawing power converter 15 detects an encoder frequency (rotational frequency of a drum 3), changes the detected encoder frequency into a drawing frequency, and is generating the drawing clock signal based on the obtained drawing frequency. The transform coefficient designating device 19 which carries out the adjustable directions of the transform coefficient at the time of changing an encoder frequency into a drawing frequency is attached to this encoder frequency-drawing power converter 15. This transform coefficient designating device 19 is directing the transform coefficient based on the signal from the retrieval equipment 17 mentioned later. In addition, a PLL (Phase-Locked Loop) circuit can be used as the encoder frequency-drawing power converter 15 and a transform coefficient designating device 19.

[0026] Next, explanation of control of the passing speed to the shaft orientations of the write-in equipment 4 by the traverse driving gear 8 performs this control using the traverse rate designating device 16, retrieval equipment 17, and a database 18. The traverse rate designating device 16 detects the rotation phase of a drum 3 from Z phase signal from a rotary encoder 6 to coincidence while detecting the rotational speed of a drum 3 from A from a rotary encoder 6, and a B phase signal. Moreover, based on the signal (traverse position signal) from the rotary encoder with which the traverse driving gear 8 was equipped and which is not illustrated, the shaft-orientations location of write-in equipment 4 is detected. And the signal (traverse rate indication signal) which instructs the passing speed to the shaft orientations of write-in equipment 4 to be such detection information based on the control pattern searched with retrieval equipment 17 is outputted to the traverse driving gear 8.

[0027] While the passing speed on printing plate section 3A increases from the rate later than a criteria rate (passing speed in case there is no fan-out) to the rate quicker than a criteria rate gradually with this operation gestalt as write-in equipment 4 progresses to a termination side from the shaft-orientations start edge side of a drum 3, the above-mentioned control pattern It is set up so that each write-in starting position for every rotation period of the drum 3 on printing plate section 3A may become the same spacing. This setup supports the fan-out of a print sheet, and a fan-out which adds like a sheet, adds from a head side, is missing from a hips side, and spreads in trapezoidal shape crosswise [right-and-left] gradually especially.

[0028] Drawing 2 is a timing diagram which shows the example of a control pattern. As shown in drawing 2, with this operation gestalt, passing speed of write-in equipment 4 is changed between printing plate section 3A and non-printing plate section (field where pattern excluding printing plate section 3A from peripheral face of drum 3 is not written in) 3B. If it averages by printing plate section 3A and non-printing plate section 3B, this will adjust the rate of non-printing plate section 3B according to the amount of delay (accelerating) to the criteria rate in printing plate section 3A so that it may become a criteria rate.

[0029] By the start edge side of shaft orientations, the passing speed in printing plate section 3A was set up lower than a criteria rate, and, specifically, the passing speed in non-printing plate section 3B is set up more highly than a criteria rate. And the passing speed in printing plate section 3A is gradually increased as it progresses to the termination side of shaft orientations. While it is made to fall gradually in inverse proportion with the passing speed in printing plate section 3A and printing plate section 3A and non-printing plate section 3B make a criteria rate carry out abbreviation coincidence in near the center of shaft orientations (near a version center), the passing speed in non-printing plate section 3B The size relation of the rate between printing plate section 3A and non-printing plate section 3B is reversed. Moreover, the relation of the rate between printing plate section 3A and non-printing plate section 3B following it So that the distance between each write-in starting position (location which changes from non-printing plate section 3B to printing plate section 3A) may become equal That is, it is set up so that the area A2 surrounded by the area A1 surrounded by the line which shows the passing speed in printing plate section 3A shown in drawing 2, and the criteria speed line, the line which shows the passing speed in non-printing plate section 3B, and the criteria speed line may become equal.

[0030] In addition, the die length (time amount length) T1 of printing plate section 3A on the time-axis in drawing 2 and the die length (time amount length) T2 of non-printing plate section 3B are die length decided each die length of printing plate section 3A in the hoop direction of a drum 3, and non-printing plate section 3B, and the rotation period of a drum 3. For example, the perimeter of a drum 3 is 900mm, among those printing plate section 3A is 600mm, the thing which a drum 3 rotates one time by 300msec(s), then T1 are set to 200msec(s), and T2 is set to 100msec(s).

[0031] Although the pattern is written in printing plate section 3A of the raw version 5 in the direction of slant in the shape of a spiral by horizontal scanning by rotation of a drum 3, and vertical scanning by migration of write-in equipment 4, by controlling the passing speed of write-in equipment 4 by the above control patterns comes to show the migration locus (drawing Rhine of a pattern) of the write-in equipment 4 on printing plate section 3A to drawing 3 (a). In addition, the locus shown as the continuous line in drawing is drawing Rhine when controlling the passing speed of write-in equipment 4 as mentioned above, and the locus

shown according to a two-dot chain line is drawing Rhine when moving write-in equipment 4 at a criteria rate. In order to make it intelligible, any Rhine exaggerates **** and shows the include angle to a drum hand of cut.

[0032] As shown in drawing 3 (a), as soon as the include angle α which drawing Rhine makes to a main scanning direction (hand of cut of a drum 3) is smaller than the include angle when writing in at a criteria rate and spreads the include angle at the time of the writing by the criteria rate, abbreviation, etc. near a printing plate center, it becomes larger than the include angle at the time of the writing by the criteria rate by the shaft-orientations termination side (drawing termination side) at a shaft-orientations start edge side (drawing initiation side). Thereby, it spreads gradually in the write-in starting position, the time of the writing by the criteria rate and an equal adding spacing of drawing Rhine, and applying it to a hips side. For this reason, as shown in drawing 3 (b), it will be gradually expanded to trapezoidal shape crosswise [right-and-left], adding the pattern drawn by printing plate section 3A, adding it from a head side like the fan-out of a print sheet, and applying it to a hips side. In addition, the field shown according to the two-dot chain line in drawing shows the drawing field of a pattern when the field which shows the drawing field of the pattern when moving write-in equipment 4 at a criteria rate, and is shown as a continuous line controls the passing speed of write-in equipment 4 as mentioned above.

[0033] With this operation gestalt, the above control patterns were prepared for every printing conditions, and it has memorized in the database 18. Printing conditions are conditions which influence the fan-out of the print sheet of a paper type, printing pressure, and others. Moreover, the location on printing Rhine of the printing station where it is equipped with a version is also included in this printing condition. For example, elongation — being easy — paper and elongation — being hard — paper — elongation — being easy — that in which the way of a fan-out of paper is greatly — it is — elongation — being easy — a pattern uses paper as a control pattern which spreads crosswise [right-and-left]. Moreover, about the location of a printing station, it considers as a control pattern with which a pattern spreads crosswise [right-and-left] as for a down-stream printing station since a fan-out becomes large as for a down-stream printing station. Specifically, the velocity error of the passing speed of the write-in equipment 4 to the criteria rate by the side of the shaft-orientations start edge and shaft-orientations termination (rate near a version center) is set up greatly.

[0034] Moreover, the value of the transform coefficient according to printing conditions is also memorized by the database 18 with the control pattern. This transform coefficient is a multiplier used for frequency conversion in the encoder frequency-drawing power converter 15, and the writing speed by write-in equipment 4 will change according to the magnitude of a transform coefficient. For example, writing speed becomes slow, so that a transform coefficient is small, and as shown in drawing 4 (a), drawing Rhine on the raw version 5 will be expanded to a lengthwise direction (hoop direction of a drum 3). In addition, the locus shown according to the two-dot chain line in drawing is drawing Rhine at the time of setting a transform coefficient as a reference value, and the locus shown as a continuous line is drawing Rhine at the time of setting up a transform coefficient smaller than a reference value.

[0035] Since the fan-out of a print sheet is produced not only in the right-and-left cross direction but in a lengthwise direction, it becomes possible to make it correspond also to the fan-out to a lengthwise direction, and to make a pattern transform, as a transform coefficient is shown in drawing 4 (b) by carrying out an adjustable setup according to printing conditions in this way. In addition, the field which the field shown according to the two-dot chain line in drawing shows the drawing field of the pattern at the time of setting a transform coefficient as a reference value, and is shown as a continuous line shows the drawing field of the pattern at the time of setting up a transform coefficient as mentioned above smaller than a reference value.

[0036] If a pattern is expanded to a hoop direction, the rate of printing plate section 3A and non-printing plate section 3B in the hoop direction of a drum 3 will change. So, with this operation gestalt, change of the rate of this printing plate section 3A and non-printing plate section 3B is taken into consideration, and a setup of the relation between the die length T1 of printing plate section 3A on the time-axis in drawing 2 and the die length T2 of non-printing plate section 3B is synchronized with the size of a transform coefficient. That is, the passing speed of the write-in equipment 4 by the traverser 2 is synchronized with the writing speed of write-in equipment 4, and is controlled. Since printing plate section 3A is specifically elongated by the hoop direction of a drum 3 so that a transform coefficient becomes small, only the part to which printing plate section 3A was extended sets up T1 for a long time, and only the part sets up T2 short conversely.

[0037] The control pattern and transform coefficient which agreed on printing conditions from the above-mentioned database 18 are searched with retrieval equipment 17. The searched control pattern is inputted into the traverse rate designating device 16, and a transform coefficient is inputted into the transform coefficient designating device 19. In addition, printing conditions are inputted through the input unit which is not illustrated. Operators, such as a keyboard, may input this input device by the manual entry, and may input it on-line from down-stream presswork.

[0038] According to the platemaking equipment applied to this operation gestalt by controlling the timing of laser radiation by write-in equipment 4, and the passing speed of the write-in equipment 4 by the traverser 2 as mentioned above, the pattern which added from the head side in addition to printing plate section 3A on a drum 3, was missing from the hips side, and was gradually expanded to trapezoidal shape crosswise [right-and-left] can be drawn. Moreover, the pattern expanded to coincidence also in the lengthwise direction can also be drawn. And such expansion deformation can be set as arbitration by setup of a control pattern or a transform coefficient according to printing conditions.

[0039] therefore — according to the platemaking equipment concerning this operation gestalt — the former — like — a fan-out — it becomes possible to obtain the version for printing with which it can be made to be able to respond to the fan-out of a print sheet, and the aim between colors can be doubled easily, without using vice. In addition, although it adds strictly, it adds a head side and spacing of a dot differs partly by the hips side in the control system concerning this operation gestalt, it is extent which is fully small as for the amount, and does not become a problem (for example, the right-and-left width of face of a drum 3 is expand 900mm, and the clearance between 200micro, then the drawing pattern for every rotation of a drum 3 is set to $\approx (200 \text{ micrometer} / 10 \text{ mm/sec} / 300 \text{ msec}) 0.7 \text{ micro}$ in an amount).

[0040] Next, the 2nd operation gestalt of this invention is explained using drawing 5 R> 5 and drawing 6. In addition, since it is the same configuration as the platemaking equipment concerning the 1st operation gestalt shown in drawing 1, the platemaking equipment concerning this operation gestalt is hereafter explained using the same sign as the 1st operation gestalt. The control approach of the passing speed of write-in equipment 4 according [the 2nd operation gestalt] to a traverser 2, i.e., a control pattern, differs from the 1st operation gestalt. Here, drawing 5 is a timing diagram which shows an example of the control pattern concerning this operation gestalt, and drawing 6 is drawing showing the write-in condition of the pattern by the control pattern of drawing 5.

[0041] This operation gestalt simplifies speed control of a traverser 2 rather than the 1st operation gestalt by not changing passing speed of write-in equipment 4. Namely, as shown in drawing 5, with this operation gestalt, fixed-speed migration is

carried out at the set-up rate, without setting up the passing speed of write-in equipment 4 more greatly than a criteria rate, and changing the passing speed of write-in equipment 4 from drawing initiation to drawing termination. In addition, the increment over the criteria rate of the passing speed of write-in equipment 4 is set up according to printing conditions so that it may mention later. Moreover, the drawing starting position of shaft orientations is set up according to passing speed so that the center of a pattern may be in agreement in the center of printing plate section 3A.

[0042] By controlling the passing speed of write-in equipment 4 by the above control patterns comes to show the migration locus (drawing Rhine of a pattern) of the write-in equipment 4 on printing plate section 3A to drawing 6 (a). In addition, the locus shown as the continuous line in drawing is drawing Rhine when controlling the passing speed of write-in equipment 4 as mentioned above, and the locus shown according to a two-dot chain line is drawing Rhine when moving write-in equipment 4 at a criteria rate.

[0043] As shown in drawing 6 (a), the include angle alpha which drawing Rhine makes to a main scanning direction (hand of cut of a drum 3) becomes larger than the include angle when writing in at a criteria rate by setting up the passing speed of write-in equipment 4 more greatly than a criteria rate. Thereby, spacing of drawing Rhine spreads rather than the time of writing in at a criteria rate. For this reason, the pattern drawn by printing plate section 3A will be uniformly expanded crosswise [right-and-left], as shown in drawing 6 (b). In addition, the field shown according to the two-dot chain line in drawing shows the drawing field of a pattern when the field which shows the drawing field of the pattern when moving write-in equipment 4 at a criteria rate, and is shown as a continuous line controls the passing speed of write-in equipment 4 as mentioned above.

[0044] Also with this operation gestalt, the above-mentioned control pattern is prepared for every printing conditions, and is memorized by the database 18. For example, rather than the control pattern corresponding to the printing conditions that a fan-out is small, the control pattern corresponding to the printing conditions that a fan-out is large is greatly set up in the increment over the criteria rate of passing speed so that the dilation ratio to the right-and-left cross direction may become large. Moreover, the drawing starting position of shaft orientations is also set up for every printing conditions according to the control pattern so that the center of a pattern may be in agreement in the center of printing plate section 3A.

[0045] Furthermore, the value of the transform coefficient (multiplier used for frequency conversion to the drawing frequency of an encoder frequency) according to printing conditions is also memorized by the database 18 for every printing conditions with the control pattern like the 1st operation gestalt. And according to the magnitude of a transform coefficient, adjustable control also of the writing speed by write-in equipment 4 is carried out with the passing speed of the write-in equipment 4 by the traverser 2. In addition, although a pattern is expanded to a lengthwise direction (hoop direction of a drum 3), in consideration of change of the rate of printing plate section 3A and non-printing plate section 3B by the expansion to the hoop direction of a pattern, it synchronizes the passing speed of the write-in equipment 4 by the traverser 2 with the writing speed of write-in equipment 4, and is controlling it also by this operation gestalt, so that writing speed becomes slow.

[0046] As mentioned above, according to the platemaking equipment concerning this operation gestalt, the pattern uniformly expanded to printing plate section 3A on a drum 3 crosswise [right-and-left] to the sample pattern can be drawn. Moreover, the pattern expanded to coincidence also in the lengthwise direction can also be drawn. And such expansion deformation can be set as arbitration by setup of a control pattern or a transform coefficient according to printing conditions.

[0047] therefore, the platemaking equipment concerning this operation gestalt — the former — like — a fan-out — it becomes possible to obtain the version for printing with which it can be made to be able to respond to the fan-out of a print sheet, and the aim between colors can be doubled easily, without using vice. Moreover, according to this operation gestalt, there is an advantage that it can respond to the fan-out of a print sheet by easier control than the 1st operation gestalt. Although the version for printing engraved with the control pattern of the 1st operation gestalt to the fan-out which adds, adds from a head side like the fan-out of the sheet especially printed with a sheet printing machine, is missing from a hips side, and deforms into trapezoidal shape is suitable, the version for printing engraved with the control pattern of this operation gestalt like the fan-out of the newsprint printed, for example by the rotary press to the fan-out which is extended to abbreviation homogeneity crosswise [right-and-left] is suitable.

[0048] As mentioned above, although two operation gestalten of this invention were explained, it cannot be overemphasized that this invention can deform variously in the range which is not limited to an above-mentioned operation gestalt and does not deviate from the meaning of this invention, and it can carry out. According to the configuration of the platemaking equipment concerning an above-mentioned operation gestalt, the passing speed of write-in equipment 4 is controllable to arbitration according to the rotation phase of a drum 3, or the shaft-orientations location of write-in equipment 4. Therefore, it is not limited to the thing of each above-mentioned operation gestalt, and the control pattern which controls the passing speed of write-in equipment 4 can set up the control pattern of arbitration according to the condition of the fan-out of a print sheet.

[0049] If an example is given, it is also possible to control the passing speed of write-in equipment 4 by the control pattern as shown in drawing 7. The passing speed of write-in equipment 4 is made to specifically increase gradually as write-in equipment 4 advances near the center of printing plate section 3A from the drawing starting position of the shaft-orientations start edge of a drum 3, and in the center of printing plate section 3A, it considers as the highest passing speed. And the passing speed of write-in equipment 4 is gradually reduced as it goes to the drawing termination location of shaft-orientations termination from the center of printing plate section 3A. The velocity distribution of shaft orientations is made into the symmetry by the shaft-orientations start edge and termination side to the center of printing plate section 3A, and the criteria rate is made to carry out abbreviation coincidence of the passing speed near a drawing starting position and in near a drawing termination location here. Moreover, the drawing starting position of shaft orientations is set up so that the center of a pattern may be in agreement in the center of printing plate section 3A.

[0050] By controlling the passing speed of write-in equipment 4 by the above control patterns comes to show the migration locus (drawing Rhine of a pattern) of the write-in equipment 4 on printing plate section 3A to drawing 8 (a). In addition, the locus shown as the continuous line in drawing is drawing Rhine when controlling the passing speed of write-in equipment 4 as mentioned above, and the locus shown according to a two-dot chain line is drawing Rhine when moving write-in equipment 4 at a criteria rate.

[0051] It becomes equal to the include angle when writing [in / it is equal to the include angle when writing in the include angle alpha which drawing Rhine makes to a main scanning direction (hand of cut of a drum 3) as shown in drawing 8 (a) at a criteria rate by the shaft-orientations start edge, become the largest near a printing plate center, and / shaft-orientations termination] in at a criteria rate again. Thereby, it spreads gradually, applying [of drawing Rhine] it in the center of a printing plate from the shaft-orientations start edge, and it narrows again from the center of a printing plate, applying it to shaft-orientations termination. moreover, spacing of drawing Rhine [in / in this case / the lengthwise direction (hoop direction of a drum 3) of

printing plate section 3A] — abbreviation — it is equal.

[0052] For this reason, the pattern drawn by printing plate section 3A will be expanded crosswise [right-and-left] crosswise [right-and-left] especially in a pattern center section, as shown in drawing 8 (b). Also in this case, the passing speed of write-in equipment 4 is set up corresponding to printing conditions, and to the printing conditions that a fan-out is large, the passing speed near a version center is greatly set up so that the dilation ratio to the right-and-left cross direction may become large rather than the printing conditions that a fan-out is small. In addition, the field shown according to the two-dot chain line in drawing shows the drawing field of a pattern when the field which shows the drawing field of the pattern when moving write-in equipment 4 at a criteria rate, and is shown as a continuous line controls the passing speed of write-in equipment 4 as mentioned above.

[0053] Moreover, although an adjustable setup of the transform coefficient at the time of changing an encoder frequency into a drawing frequency with the transform coefficient designating device 19 is carried out with the platemaking equipment concerning an above-mentioned operation gestalt, according to the shaft-orientations location of write-in equipment 4, it is made to carry out an adjustable setup of this transform coefficient. In this case, while carrying out easy [of the setting pattern (control pattern) of a transform coefficient according to the shaft-orientations location of write-in equipment 4] beforehand for every printing conditions and memorizing in the database 18, the traverse position signal from the rotary encoder of the traverse driving gear 8 is constituted possible [an input] in the transform coefficient designating device 19. And the set point of a transform coefficient is acquired based on the setting pattern searched with retrieval equipment 17, and a traverse position signal, and it outputs to the encoder frequency-drawing power converter 15. Thereby, it becomes possible to change the writing speed by write-in equipment 4 according to the shaft-orientations location of a drum 3.

[0054] Furthermore, A from a rotary encoder 6, B, and Z phase signal are inputted into the transform coefficient designating device 19, and it is made to carry out an adjustable setup of the transform coefficient according to the rotation phase of a drum 3. It is desirable to carry out easy [of the setting pattern (control pattern) of a transform coefficient according to the rotation phase of a drum 3] beforehand for every printing conditions also in this case, and to memorize in a database 18. Thereby, it becomes possible to change the writing speed by write-in equipment 4 according to the rotation phase of a drum 3. Furthermore, writing speed by write-in equipment 4 may not be made adjustable like an above-mentioned operation gestalt, but adjustable control of the rotational speed of a drum 3 may be carried out according to printing conditions. A pattern can be made to transform into a lengthwise direction also by this. In addition, according to the rotational speed of a drum 3, the passing speed of write-in equipment 4 is controlled in this case. Furthermore, it is also possible to carry out adjustable control of the writing speed of write-in equipment 4 and the rotational speed of a drum 3 according to both printing conditions.

[0055] Furthermore, although the above-mentioned operation gestalt explained the case where this invention was applied to the platemaking equipment of dedication, this invention is applicable also to the on-board platemaking printing machine which incorporated platemaking equipment as one internal function. An on-board platemaking printing machine also has the format which writes a direct pattern in the peripheral face of a printing cylinder besides the format which equips with the raw version and writes in a pattern on the peripheral face of a printing cylinder (drum), and this invention can be applied to the all. Moreover, the write-in method of a pattern is not limited to the method which exposes the photosensitive printing plate section like an above-mentioned operation gestalt with beams of light, such as a laser beam, and writes in a pattern pattern, and various write-in methods can be used for it according to creation methods of the version for printing, such as a method which the drop of a plate is made to adhere to the printing plate section like an ink jet, and writes in a pattern pattern.

[0056]

[Effect of the Invention] Since the pattern which made it deform into the printing plate section crosswise [right-and-left] to a sample pattern by controlling the passing speed of the write-in equipment to the rotational speed of a drum according to printing conditions can draw according to the platemaking equipment (1st platemaking equipment) of this invention as explain in full detail above , it becomes possible to obtain the version for printing with which it can be made to be able to respond to the fan-out of a print sheet , and the aim between colors can double easily . It becomes possible to obtain easily the version for printing according to printing conditions by memorizing the control pattern of the passing speed of write-in equipment for every printing conditions according to the fan-out of the cross direction of a print sheet in the database, and controlling the passing speed of write-in equipment especially, based on the control pattern searched from this database.

[0057] Moreover, while controlling the writing speed of the write-in equipment to the rotational speed of a drum according to printing conditions according to another platemaking equipment (2nd platemaking equipment) of this invention Since the pattern which made the lengthwise direction deform into the printing plate section to a sample pattern by making it synchronize with the writing speed of write-in equipment, and controlling the passing speed of the write-in equipment to the rotational speed of a drum can be drawn It becomes possible to obtain the version for printing with which it can be made to be able to respond to the fan-out of a print sheet, and the aim between colors can be doubled easily.

[0058] It becomes possible to obtain easily the version for printing according to printing conditions by memorizing the control pattern of the writing speed of write-in equipment for every printing conditions according to the fan-out of the lengthwise direction of a print sheet in the database, and controlling the writing speed of write-in equipment especially, based on the control pattern searched from this database.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the platemaking equipment of the method (the so-called outside drum method) which writes in a pattern to the printing plate with which the peripheral face of a drum was equipped especially about the platemaking equipment which creates the version for printing based on the digital data of a sample pattern.

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PRIOR ART

[Description of the Prior Art] In recent years, digitization of a platemaking process is advanced and a workflow called CPT (Computer toPlate) which creates the version for printing directly based on the digital data (image data) which digitized the sample pattern is established. According to the system (henceforth a CPT system) using this workflow, since it is not necessary to create the film used as the block copy, reduction of cost can be aimed at and there is an advantage that a sample pattern is faithfully reproducible with a high location precision.

[0003] As platemaking equipment applied to such a CPT system, the so-called platemaking equipment of an outside drum method as shown in drawing 9 (a) is known. This platemaking equipment arranges the write-in equipments 4, such as laser, in a peripheral face towards the drum 3 equipped with the raw version (version with which the pattern is not written in). Making an one direction carry out high-speed rotation of the drum 3 with constant speed, and moving write-in equipment 4 to the shaft orientations of a drum 3 with constant speed by the traverser 2 By irradiating a laser beam towards the peripheral face on a drum 3 based on image data from write-in equipment 4, a pattern is written in the printing plate section (field of a pattern where it is equipped with the raw version and which can be written in) of a drum 3.

[0004] With this platemaking equipment, the hand of cut of a drum 3 turns into a main scanning direction, the migration direction of the write-in equipment 4 by the traverser 2 becomes in the direction of vertical scanning, and as shown in drawing 9 (b), a pattern is written in the printing plate section on the raw version 5 in the direction of slant in the shape of a spiral. The pattern written in the printing plate section serves as the same scale as a sample pattern in principle [reappearing-as faithfully as possible] for a sample pattern. In addition, a printing machine may be on board to the platemaking equipment of this method, the on-board platemaking printing machine which engraves directly may also be contained in it, and especially CPT may be read with Computer to Press in this case.

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EFFECT OF THE INVENTION

[Effect of the Invention] Since the pattern which made it deform into the printing plate section crosswise [right-and-left] to a sample pattern by controlling the passing speed of the write-in equipment to the rotational speed of a drum according to printing conditions can draw according to the platemaking equipment (1st platemaking equipment) of this invention as explain in full detail above , it becomes possible to obtain the version for printing with which it can be make to be able to respond to the fan-out of a print sheet , and the aim between colors can double easily . It becomes possible to obtain easily the version for printing according to printing conditions by memorizing the control pattern of the passing speed of write-in equipment for every printing conditions according to the fan-out of the cross direction of a print sheet in the database, and controlling the passing speed of write-in equipment especially, based on the control pattern searched from this database.

[0057] Moreover, while controlling the writing speed of the write-in equipment to the rotational speed of a drum according to printing conditions according to another platemaking equipment (2nd platemaking equipment) of this invention Since the pattern which made the lengthwise direction deform into the printing plate section to a sample pattern by making it synchronize with the writing speed of write-in equipment, and controlling the passing speed of the write-in equipment to the rotational speed of a drum can be drawn It becomes possible to obtain the version for printing with which it can be made to be able to respond to the fan-out of a print sheet, and the aim between colors can be doubled easily.

[0058] It becomes possible to obtain easily the version for printing according to printing conditions by memorizing the control pattern of the writing speed of write-in equipment for every printing conditions according to the fan-out of the lengthwise direction of a print sheet in the database, and controlling the writing speed of write-in equipment especially, based on the control pattern searched from this database.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] By the way, it is known for the printing machine, for example, a sheet printing machine, that the fan-out phenomenon in which the dimension of a print sheet spreads will arise with the ununiformity of the content moisture of a print sheet (sheet) or front-face nature by use of dampening water. Generally a print sheet adds this fan-out phenomenon, it will be remarkable to a hips side, a print sheet will add, and a hips side will spread in a flabellate form.

[0006] And in the sheet printing machine of a multi-printing station mold, in order to convey making it deliver to the next printing station one by one through a middle drum holding the tip of a print sheet by the pawl of an impression cylinder, the amount of fan-outs for every station changes with maintenance situations in the pressure and the pawl by each drum. The hips of a print sheet spread gradually in order as are shown in drawing 10 and it specifically progresses with 1st station 1C, 2nd station 2C, 3rd station 3C, and 4th station 4C. This is the same also at the rotary press for newspapers, and a band-like print sheet (newsprint) spreads crosswise [right-and-left] as it goes down-stream.

[0007] As mentioned above, with the platemaking equipment in the conventional CPT system, since it is considering as the reproducing-as faithfully as possible-sample pattern principle, although the amounts of fan-outs differ for every printing station, a pattern is altogether written in by the same scale. For this reason, the pattern of each color printed the whole printing station brings a result from which the aim between colors shifts by each fan-out.

[0008] in order to amend a gap of the aim between these colors — the former — a fan-out — although the hips side of a lithographic plate is extended using vice and he is trying to double the aim between colors, when right-and-left width of face is 900mm, it extends, and since there are very few amounts as 200-micrometer [a maximum of] order, ***** corresponding to the amount of fan-outs has the technical problem that the adjustment takes skill. moreover — although there is a thing of the format that the printing plate section is formed in the peripheral face of a printing cylinder itself, and a direct pattern is written in the peripheral face of a printing cylinder, in an on-board platemaking printing machine — in this case — a fan-out — vice — the very thing cannot be used.

[0009] It is originated in view of such a technical problem, and this invention aims at offering the platemaking equipment which made it possible to obtain the version for printing with which it can be made to be able to respond to the fan-out of a print sheet in a CPT system, and the aim between colors can be doubled easily.

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the platemaking equipment of this invention The drum which performs horizontal scanning by rotation while having the printing plate section on a peripheral face, The write-in equipment which is arranged towards the peripheral face of this drum and writes in the dot pattern of a pattern alternatively on this printing plate section based on the digital data of a sample pattern, The migration equipment which performs vertical scanning by moving this write-in equipment to the shaft and parallel direction of this drum, It is characterized by having the passing speed control means which controls the passing speed of this write-in equipment to the rotational speed of this drum according to printing conditions (location on printing Rhine of a paper type, printing pressure, and a corresponding printing station etc.). It becomes possible to make by this the pattern drawn by this printing plate section correspond to the fan-out of a print sheet, and to make arbitration deform crosswise [right-and-left] to a sample pattern.

[0011] In this case, the thing of various write-in methods is applied according to the creation method of versions for printing, such as what exposes the photosensitive printing plate section with beams of light, such as a laser beam, as write-in equipment, and writes in a pattern pattern, and a thing which the drop of a plate is made to adhere to the printing plate section, and writes in a pattern pattern. Moreover, this printing plate section is a field which serves as a version for printing by writing in a pattern, and when twist the raw version, and it fixes on the peripheral face of this drum and also above platemaking equipment is constituted as an on-board platemaking printing machine, it may use the peripheral face of the printing cylinder applicable to this drum itself as the printing plate section.

[0012] Preferably, the control pattern of the passing speed of this write-in equipment by this passing speed control means is memorized for every printing conditions according to the fan-out of the cross direction of a print sheet in the database, the control pattern according to the printing conditions inputted through the input means is searched from this database with a retrieval means, and the passing speed of this write-in equipment is controlled based on the searched control pattern.

[0013] Moreover, in above platemaking equipment, the passing speed of this write-in equipment is made to increase as this write-in equipment advances in the center from the shaft-orientations start edge side of this drum, and control by this passing speed control means may be performed so that the passing speed of this write-in equipment may be decreased, as this write-in equipment progresses to a termination side from the center of shaft orientations of this drum. Thereby, the pattern especially expanded crosswise [right-and-left] crosswise [right-and-left] in near the center of this printing plate section to the sample pattern is drawn by this printing plate section. In this case, the velocity error over the passing speed in the center of shaft orientations of this drum is more preferably set as the symmetry by the shaft-orientations start edge and termination side. Thereby, the pattern symmetrically transformed crosswise [right-and-left] from the center of this printing plate section is drawn by this printing plate section.

[0014] Furthermore, it sets to above platemaking equipment and you may make it control the passing speed of this write-in equipment on the non-printing plate section (parts other than the printing plate section among the peripheral faces of this drum) of this drum by this passing speed control means according to the passing speed of this write-in equipment on this printing plate section so that each write-in starting position for every rotation period of this drum on this printing plate section becomes the same spacing. Thereby, the thing with few fan-outs which you add and is made in agreement [the right-and-left width of face of a pattern] with the right-and-left width of face of a sample pattern about a head side becomes possible the tip side of this printing plate section.

[0015] In this case, preferably, control by this passing speed control means is performed so that the passing speed of this write-in equipment on this printing plate section may be made to increase, as this write-in equipment progresses to a termination side from the shaft-orientations start edge side of this drum. It becomes possible to draw the pattern which deformed into the trapezoid with which it added to this printing plate section to the sample pattern, and the hips side was expanded crosswise [right-and-left] by this. Moreover, the absolute value of the velocity error over the passing speed in the center of shaft orientations of this drum on this printing plate section is more preferably set as the symmetry by the shaft-orientations start edge and termination side in this case. Thereby, the pattern of symmetrical trapezoidal shape is drawn crosswise [right-and-left] from the center of this printing plate section at this printing plate section.

[0016] In order to attain the above-mentioned purpose, moreover, another platemaking equipment (2nd platemaking equipment) of this invention The drum which performs horizontal scanning by rotation while having the printing plate section on a peripheral face, The write-in equipment which is arranged towards the peripheral face of this drum and writes in the dot pattern of a pattern alternatively on this printing plate section based on the digital data of a sample pattern, The migration equipment which performs vertical scanning by moving this write-in equipment to the shaft and parallel direction of this drum, The writing speed control means which controls the writing speed of this write-in equipment to the rotational speed of this drum according to printing conditions (location on printing Rhine of a paper type, printing pressure, and a corresponding printing station etc.). It is characterized by having the passing speed control means which is synchronized with the writing speed of this write-in equipment, and controls the passing speed of this write-in equipment to the rotational speed of this drum. It becomes possible to make by this the pattern drawn by this printing plate section correspond to the fan-out of a print sheet, and to make arbitration deform into a lengthwise direction (hoop direction of this drum) to a sample pattern.

[0017] Preferably, the control pattern of the writing speed of this write-in equipment by this writing speed control means is memorized for every printing conditions according to the fan-out to the lengthwise direction of this print sheet in the database, the control pattern according to the printing conditions inputted through the input means is searched from this database with a retrieval means, and the writing speed of this write-in equipment is controlled based on the searched control pattern.

[0018]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing. First, drawing 1 - drawing 4 show the platemaking equipment concerning the 1st operation gestalt of this invention. The platemaking equipment applied to this operation gestalt as shown in drawing 1 is a traverser which moves the write-in equipment 4 which is platemaking equipment of an outside drum method and was arranged by the peripheral face as usual towards the peripheral face of the drum 3 equipped with the raw version 5, and a drum 3, and write-in equipment 4 to the shaft orientations of a drum 3.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the functional block diagram showing the configuration of the platemaking equipment concerning the 1st operation gestalt of this invention.

[Drawing 2] It is the timing diagram which shows the control pattern of the shaft-orientations passing speed of the write-in equipment concerning the 1st operation gestalt of this invention.

[Drawing 3] It is drawing showing the write-in condition of the pattern by the control pattern of drawing 2 , and drawing in which (a) shows drawing Rhine on the raw version, and (b) are drawings showing the drawing field of a pattern.

[Drawing 4] It is drawing showing the write-in condition of the pattern when changing writing speed further in drawing 3 , and drawing in which (a) shows drawing Rhine on the raw version, and (b) are drawings showing the drawing field of a pattern.

[Drawing 5] It is the timing diagram which shows the control pattern of the shaft-orientations passing speed of the write-in equipment concerning the 2nd operation gestalt of this invention.

[Drawing 6] It is drawing showing the write-in condition of the pattern by the control pattern of drawing 5 , and drawing in which (a) shows drawing Rhine on the raw version, and (b) are drawings showing the drawing field of a pattern.

[Drawing 7] It is the timing diagram which shows the modification of the control pattern of the shaft-orientations passing speed of write-in equipment.

[Drawing 8] It is drawing showing the write-in condition of the pattern by the control pattern of drawing 7 , and drawing in which (a) shows drawing Rhine on the raw version, and (b) are drawings showing the drawing field of a pattern.

[Drawing 9] (a) is drawing showing the outline configuration of the platemaking equipment of the conventional general outside drum method, and (b) is drawing showing the write-in condition of the pattern by the platemaking equipment of (a).

[Drawing 10] It is drawing showing the fan-out condition of the print sheet for every printing station in the printing machine of a multi-printing station mold.

[Description of Notations]

2 Traverser

3 Drum

3A Printing plate section

3B Non-printing plate section

4 Write-in Equipment

5 The Raw Version

6 Rotary Encoder

7 Screw Rod

8 Traverse Driving Gear

9 Drum Driving Gear

10 Control Unit

11 Image Data Generation Equipment for Printing

12 Image Buffer

13 Laser Driver

14 Image Initiation Trigger Generator

15 Encoder Frequency-Drawing Power Converter

16 Traverse Rate Designating Device

17 Retrieval Equipment

18 Database

19 Transform Coefficient Designating Device

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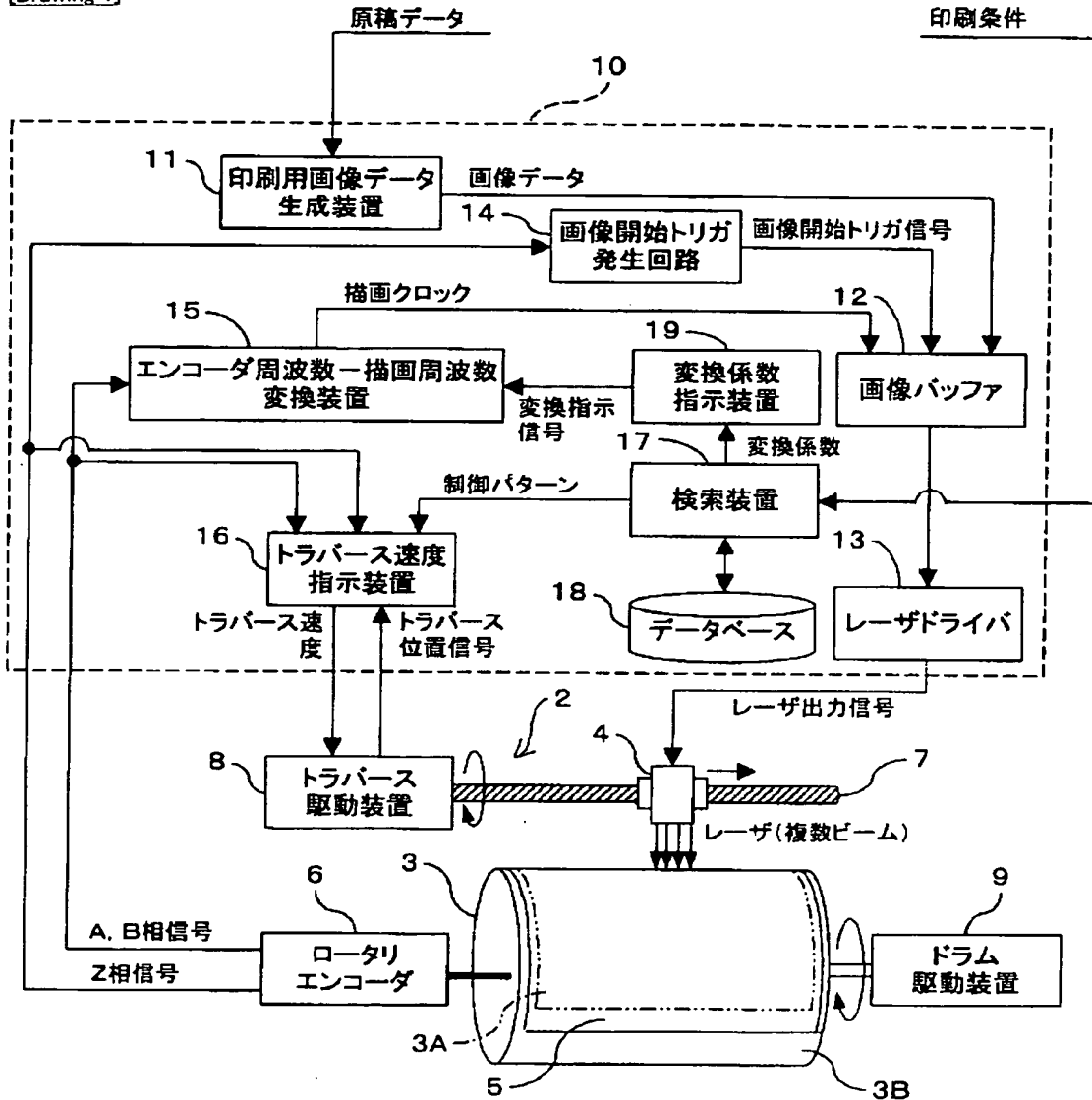
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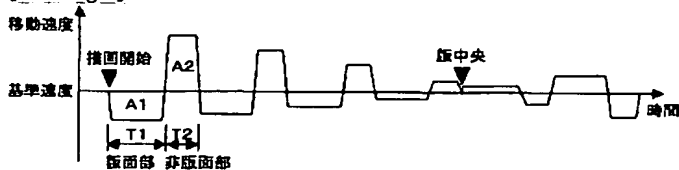
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DRAWINGS

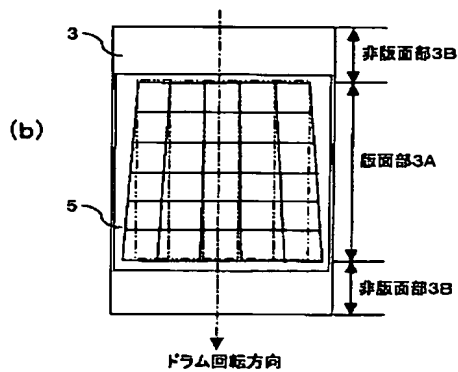
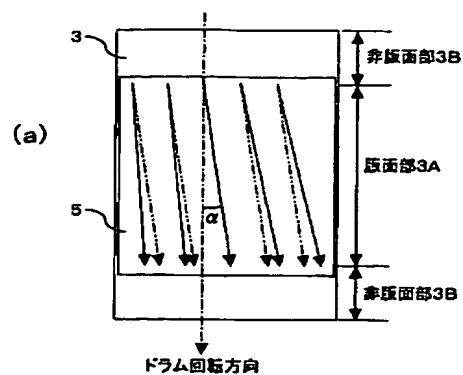
[Drawing 1]



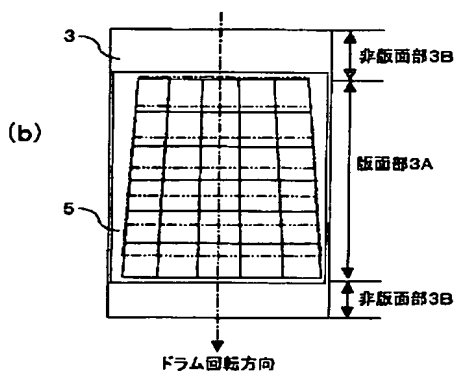
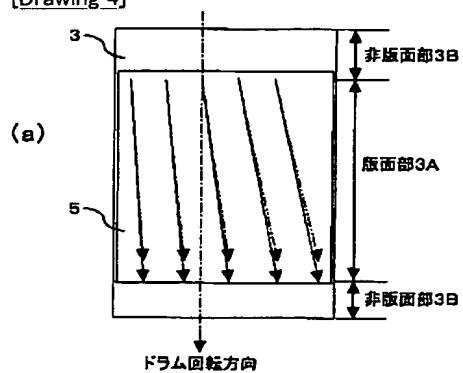
[Drawing 2]



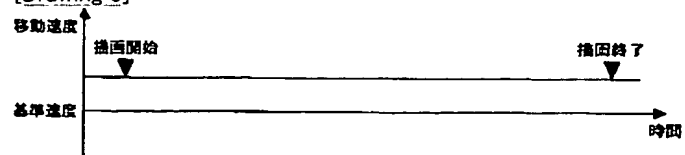
[Drawing 3]



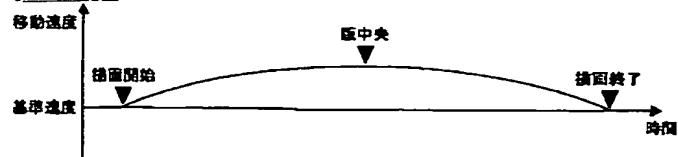
[Drawing 4]



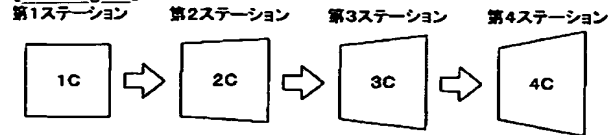
[Drawing 5]



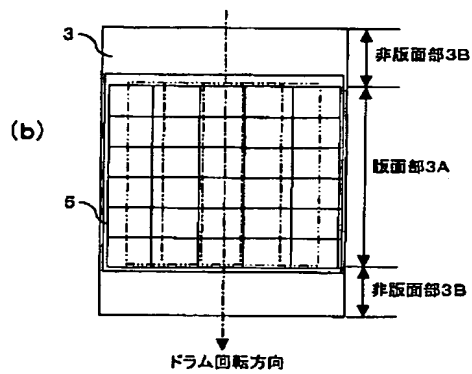
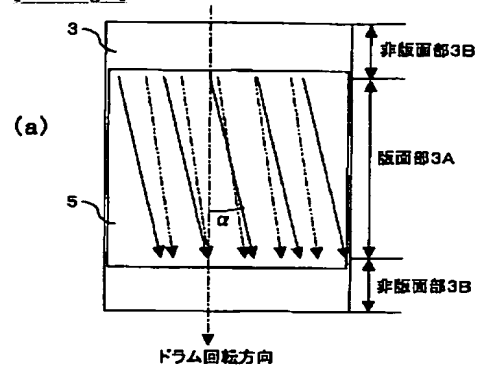
[Drawing 7]



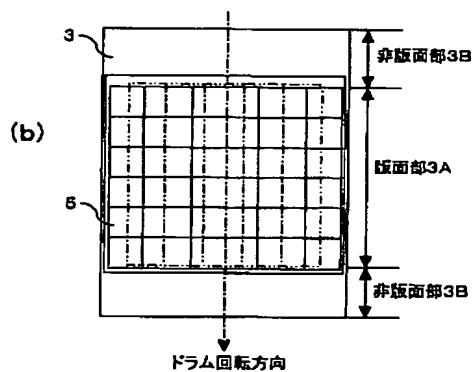
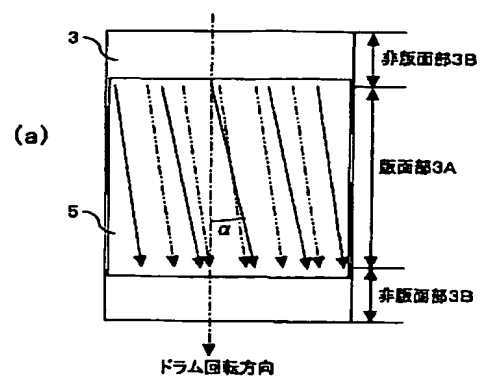
[Drawing 10]



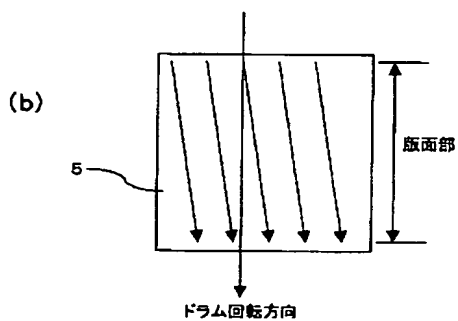
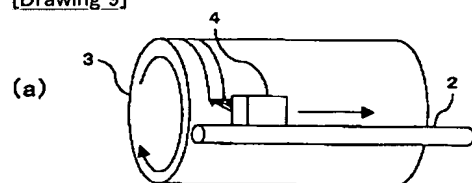
[Drawing 6]



[Drawing 8]



[Drawing 9]



[Translation done.]

【特許請求の範囲】

【請求項 1】 印刷用紙に絵柄を印刷するための印刷用版を製版する製版装置であって、
外周面上に版面部を備えるとともに回転によって主走査を行うドラムと、

該ドラムの外周面に向けて配設され見本絵柄のデジタルデータに基づき該版面部に絵柄のドットパターンを選択的に書込む書込装置と、

該書込装置を該ドラムの軸と平行方向に移動させることによって副走査を行う移動装置と、

該ドラムの回転速度に対する該書込装置の移動速度を印刷条件に応じて制御する移動速度制御手段とを備えたことを特徴とする、製版装置。

【請求項 2】 印刷条件を入力する入力手段と、

該移動速度制御手段による該書込装置の移動速度の制御パターンを該印刷用紙の幅方向へのファンアウトに応じて印刷条件毎に記憶したデータベースと、

該入力手段を介して入力された印刷条件に応じた制御パターンを該データベースから検索する検索手段とを備え、

該移動速度制御手段は、該検索手段で検索された制御パターンに基づき該書込装置の移動速度を制御することを特徴とする、請求項 1 記載の製版装置。

【請求項 3】 印刷用紙に絵柄を印刷するための印刷用版を製版する製版装置であって、

外周面上に版面部を備えるとともに回転によって主走査を行うドラムと、

該ドラムの外周面に向けて配設され見本絵柄のデジタルデータに基づき該版面部に絵柄のドットパターンを選択的に書込む書込装置と、

該書込装置を該ドラムの軸と平行方向に移動させることによって副走査を行う移動装置と、

該ドラムの回転速度に対する該書込装置の書込速度を印刷条件に応じて制御する書込速度制御手段と、

該書込装置の書込速度に同期させて該ドラムの回転速度に対する該書込装置の移動速度を制御する移動速度制御手段とを備えたことを特徴とする、製版装置。

【請求項 4】 印刷条件を入力する入力手段と、

該書込速度制御手段による該書込装置の書込速度の制御パターンを該印刷用紙の縦方向へのファンアウトに応じて印刷条件毎に記憶したデータベースと、

該入力手段を介して入力された印刷条件に応じた制御パターンを該データベースから検索する検索手段とを備え、

該書込速度制御手段は、該検索手段で検索された制御パターンに基づき該書込装置の書込速度を制御することを特徴とする、請求項 3 記載の製版装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、見本絵柄のデジタ

ルデータに基づき印刷用版を作成する製版装置に関し、特に、ドラムの外周面に備えられた版面に対して絵柄を書込む方式（いわゆる外面ドラム方式）の製版装置に関する。

【0002】

【従来の技術】 近年では製版工程のデジタル化が進められ、見本絵柄をデジタル化したデジタルデータ（画像データ）に基づき印刷用版を直接作成する CTP（Computer to Plate）というワークフローが確立されている。このワークフローを用いたシステム（以下、CTP システムという）によれば、版下となるフィルムを作成する必要がないためコストの削減が図れ、且つ、高い位置精度によって見本絵柄を忠実に再現できるという利点がある。

【0003】 このような CTP システムに適用される製版装置として、図 9（a）に示すようないわゆる外面ドラム方式の製版装置が知られている。この製版装置は、レーザ等の書込装置 4 を外周面に生版（絵柄が書込まれていない版）を装着されたドラム 3 に向けて配設して、ドラム 3 を一方向に一定速度で高速回転させ、且つ書込装置 4 をトラバーサ 2 によりドラム 3 の軸方向に一定速度で移動させながら、画像データに基づき書込装置 4 からドラム 3 上の外周面に向けてレーザ光線を照射することによって、ドラム 3 の版面部（生版が装着されている絵柄の書込み可能領域）に絵柄を書込むものである。

【0004】 この製版装置では、ドラム 3 の回転方向が主走査方向になり、トラバーサ 2 による書込装置 4 の移動方向が副走査方向になって、図 9（b）に示すように絵柄は生版 5 上の版面部にスパイラル状に斜め方向に書込まれる。版面部に書込まれる絵柄は見本絵柄を可能な限り忠実に再現すること原則としており、見本絵柄と同一縮尺となる。なお、この方式の製版装置には、印刷機の機上で直接製版を行う機上製版印刷機も含まれ、特にこの場合は、CTP は Computer to Press と読まれることもある。

【0005】

【発明が解決しようとする課題】 ところで、印刷機、例えば枚葉印刷機では、湿し水の使用による印刷用紙（枚葉紙）の含有水分や表面性の不均一により、印刷用紙の寸法が広がるファンアウト現象が生じることが知られている。このファンアウト現象は、一般に印刷用紙のくわえ尻側において著しく、印刷用紙のくわえ尻側が扇状に拡がってしまう。

【0006】 しかも、多印刷ステーション型の枚葉印刷機では、印刷用紙の先端を圧胴の爪で保持しながら中間胴を介して順次、次の印刷ステーションに受け渡しさせながら搬送するため、各胴による圧迫や爪での保持状況によって各ステーション毎のファンアウト量は異なる。

具体的には、図 10 に示すように第 1 ステーション 1 C、第 2 ステーション 2 C、第 3 ステーション 3 C、第

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4ステーション4Cと進むにつれ印刷用紙の尻が順に徐々に広がっていく。これは、新聞用の輪転機でも同様であり、帯状の印刷用紙（新聞用紙）は下流にいくにしたがい左右幅方向に広がっていく。

【0007】上述のように従来のCTPシステムにおける製版装置では、見本絵柄を可能な限り忠実に再現すること原則としているために、印刷ステーション毎にファンアウト量が異なるにも拘わらず、全て同一縮尺で絵柄が書込まれる。このため、各印刷ステーション毎で印刷された各色の絵柄は、夫々のファンアウト分だけ色間見当がずれる結果になる。

【0008】かかる色間見当のずれを補正するために、従来はファンアウト万力を用いて刷板の尻側を引き延ばし、色間見当を合わせるようにしているが、ファンアウト量に対応する尻上げ量は左右幅が900mmの場合、その上げ量が最大200 μ m前後と極めて少ないために、その調整に熟練を要するという課題がある。また、機上製版印刷機では、版胴の外周面自体に版面部が形成されて版胴の外周面に直接絵柄が書込まれる形式のものがあるが、この場合にはファンアウト万力自体を用いることができない。

【0009】本発明は、このような課題に鑑み創案されたものであり、CTPシステムにおいて印刷用紙のファンアウトに対応させて容易に色間見当を合わせることでできる印刷用版を得ることを可能にした、製版装置を提供することを目的とする。

【0010】

【課題を解決するための手段】上記目的を達成するため、本発明の製版装置は、外周面上に版面部を備えるとともに回転によって主走査を行うドラムと、該ドラムの外周面に向けて配設され見本絵柄のデジタルデータに基づき該版面部に絵柄のドットパターンを選択的に書込む書込装置と、該書込装置を該ドラムの軸と平行方向に移動させることによって副走査を行う移動装置と、該ドラムの回転速度に対する該書込装置の移動速度を印刷条件（紙種、印圧、対応する印刷ステーションの印刷ライン上での位置等）に応じて制御する移動速度制御手段とを備えたことを特徴としている。これにより、該版面部に描画される絵柄を印刷用紙のファンアウトに対応させて見本絵柄に対して左右幅方向に任意に変形させることが可能になる。

【0011】この場合、書込装置としては感光性の版面部をレーザ光線等の光線により露光して絵柄パターンを書込むものや、版面部に版材の滴を付着させて絵柄パターンを書込むもの等、印刷用版の作成方式に応じて種々の書込み方式のものが適用される。また、該版面部は絵柄が書込まれることによって印刷用版となる領域であり、該ドラムの外周面上に生版を巻きつけ固定する他、上記の製版装置が機上製版印刷機として構成される場合には、該ドラムに該当する版胴の外周面自体を版面部と

して用いてもよい。

【0012】好ましくは、データベースに該移動速度制御手段による該書込装置の移動速度の制御パターンを印刷用紙の幅方向のファンアウトに応じて印刷条件毎に記憶しておき、入力手段を介して入力された印刷条件に応じた制御パターンを検索手段により該データベースから検索して、検索された制御パターンに基づき該書込装置の移動速度を制御する。

【0013】また、上記の製版装置において、該書込装置が該ドラムの軸方向始端側から中央に進むにつれて該書込装置の移動速度を増加させ、該書込装置が該ドラムの軸方向中央から終端側に進むにつれて該書込装置の移動速度を減少させるように該移動速度制御手段による制御を行ってもよい。これにより、該版面部には見本絵柄に対して左右幅方向に、特に該版面部の中央付近を左右幅方向に拡大された絵柄が描画される。この場合、より好ましくは、該ドラムの軸方向中央における移動速度に対する速度偏差を軸方向始端側と終端側とで対称に設定する。これにより、該版面部には該版面部の中央から左右幅方向に対称的に変形した絵柄が描画される。

【0014】さらに、上記の製版装置において、該移動速度制御手段により、該版面部上における該ドラムの回転周期毎の各書込み開始位置が同一間隔になるように、該版面部上での該書込装置の移動速度に応じて該ドラムの非版面部（該ドラムの外周面のうち版面部以外の部分）上での該書込装置の移動速度を制御するようにしてもよい。これにより、該版面部の先端側、すなわち、ファンアウトの少ないくわえ頭側については、絵柄の左右幅を見本絵柄の左右幅に一致させることが可能になる。

【0015】この場合、好ましくは、該書込装置が該ドラムの軸方向始端側から終端側に進むにつれて該版面部上での該書込装置の移動速度を増加させるように該移動速度制御手段による制御を行う。これにより、該版面部には見本絵柄に対してくわえ尻側ほど左右幅方向に拡大された台形に変形した絵柄を描画することが可能になる。また、この場合、より好ましくは、該版面部上での該ドラムの軸方向中央における移動速度に対する速度偏差の絶対値を軸方向始端側と終端側とで対称に設定する。これにより、該版面部には該版面部の中央から左右幅方向に対称的な台形状の絵柄が描画される。

【0016】また、上記目的を達成するため、本発明の別の製版装置（第2の製版装置）は、外周面上に版面部を備えるとともに回転によって主走査を行うドラムと、該ドラムの外周面に向けて配設され見本絵柄のデジタルデータに基づき該版面部に絵柄のドットパターンを選択的に書込む書込装置と、該書込装置を該ドラムの軸と平行方向に移動させることによって副走査を行う移動装置と、該ドラムの回転速度に対する該書込装置の書込速度を印刷条件（紙種、印圧、対応する印刷ステーションの印刷ライン上での位置等）に応じて制御する書込速度

制御手段と、該書込装置の書込速度に同期させて該ドラムの回転速度に対する該書込装置の移動速度を制御する移動速度制御手段とを備えたことを特徴としている。これにより、該版面部に描画される絵柄を印刷用紙のファンアウトに対応させて見本絵柄に対して縦方向（該ドラムの周方向）に任意に変形させることが可能になる。

【0017】好ましくは、データベースに該書込速度制御手段による該書込装置の書込速度の制御パターンを該印刷用紙の縦方向へのファンアウトに応じて印刷条件毎に記憶しておき、入力手段を介して入力された印刷条件に応じた制御パターンを検索手段により該データベースから検索して、検索された制御パターンに基づき該書込装置の書込速度を制御する。

【0018】

【発明の実施の形態】以下、図面を参照して本発明の実施の形態を説明する。まず、図1～図4は本発明の第1実施形態にかかる製版装置を示すものである。図1に示すように、本実施形態にかかる製版装置は、外面ドラム方式の製版装置であり、従来同様に、外周面に生版5を装着されたドラム3と、ドラム3の外周面に向けて配設された書込装置4と、書込装置4をドラム3の軸方向に移動させるトラバーサ（移動手段）2とを備えている。

【0019】ドラム3の回転軸にはドラム駆動装置9とロータリエンコーダ6とが取り付けられている。ドラム駆動装置9は、ドラム3を一方向に一定速度で高速回転させるようになっている。また、ロータリエンコーダ6は、ドラム3の回転に同期してパルス信号を出力するようになっている。ロータリエンコーダ6から出力されるパルス信号のうち、A、B相信号はドラム3の回転速度（回転周波数）の検出に用いられ、Z相信号はゼロ点の検出に用いられる。また、A、B、Z相信号により、ドラム3の回転位相を正確に検出することができる。

【0020】トラバーサ2は、ドラム3の軸と平行に配設され書込装置4に螺合するネジ棒7と、ネジ棒7を回転させるトラバース駆動装置8とから構成されている。トラバース駆動装置8によるネジ棒7の回転によって、書込装置4のドラム3の軸方向への移動が実現される。トラバース駆動装置8には、図示しないロータリエンコーダが備えられており、ネジ棒7での書込装置4の位置は、このロータリエンコーダの回転数と回転位相角によって検出される。

【0021】また、書込装置4は、レーザの照射により未露光の生版5上の版面部（絵柄の書込み可能領域）3Aを選択的に露光して絵柄パターン（絵柄を構成するドットパターン）を書込む方式のレーザ書込装置として構成されている。書込装置4の内部には、複数の半導体レーザ発信器が備えられており、一度に複数点のドットパターンを得ることが可能になっている。本実施形態では、書込装置4によるレーザの照射タイミング（すなわち、版面部3Aへの絵柄の書込みタイミング）とトラバ

ース駆動装置8による書込装置4の軸方向への移動速度を、以下に説明する制御装置10によって制御している。

【0022】制御装置10は、印刷用画像データ生成装置11、画像バッファ12、レーザドライバ13、画像開始トリガ発生装置14、エンコード周波数―描画周波数変換装置15、トラバース速度指示装置16、検索装置17、データベース18及び変換係数指示装置19から構成されている。まず、書込装置4によるレーザの照射タイミングの制御について説明すると、本制御は、印刷用画像データ生成装置11、画像バッファ12、レーザドライバ13、画像開始トリガ発生装置14、エンコード周波数―描画周波数変換装置15及び変換係数指示装置19を用いて行われる。

【0023】印刷用画像データ生成装置11は、上流工程から取り込まれる各色の原稿データから印刷用の画像データ（見本絵柄のデジタルデータ）を生成する装置である。具体的には、ここでは印刷用画像データ生成装置11としてRIP（Raster Image Processor）が用いられており、このRIPによって、ページ記述言語で記述された画像、文字、図形を包括したテキストデータ（原稿データ）がビットデータ（画像データ）に変換される。印刷用画像データ生成装置11で生成された画像データは、画像バッファ12に格納される。

【0024】画像バッファ12に格納された画像データは、画像開始トリガ発生装置14からの画像開始トリガ信号をドラム3の一回転周期毎の送信開始タイミングとして、エンコード周波数―描画周波数変換装置15による描画クロック信号に基づいてシリアルにレーザドライバ13に送信される。レーザドライバ13は、画像バッファ12から送信された画像データと同期をとって書込装置4内の各レーザ発信器にレーザ出力信号を出力する。そして、書込装置4内の各レーザ発信器は、このレーザドライバ13からのレーザ出力信号の入力を受けてレーザを生版5に向けて照射する。

【0025】なお、画像開始トリガ発生装置14は、ロータリエンコーダ6からのZ相信号からドラム3の位相のゼロ点を検出して画像開始トリガ信号を発生させている。ここでは、ドラム3上の回転周期毎の各書込み開始位置の位相をゼロ点に対応させている。また、エンコード周波数―描画周波数変換装置15は、ロータリエンコーダ6からのA、B相信号からエンコード周波数（ドラム3の回転周波数）を検出し、検出したエンコード周波数を描画周波数に変換して、得られた描画周波数に基づき描画クロック信号を発生させている。このエンコード周波数―描画周波数変換装置15には、エンコード周波数を描画周波数に変換する際の変換係数を可変指示する変換係数指示装置19が付設されている。この変換係数指示装置19は、後述する検索装置17からの信号に基づいて変換係数を指示している。なお、エンコード周波

数—描画周波数変換装置 15 及び変換係数指示装置 19 としては、PLL (Phase-Locked Loop) 回路を用いることができる。

【0026】次に、トラバース駆動装置 8 による書込装置 4 の軸方向への移動速度の制御について説明すると、本制御は、トラバース速度指示装置 16、検索装置 17 及びデータベース 18 を用いて行われる。トラバース速度指示装置 16 は、ロータリエンコーダ 6 からの A、B 相信号からドラム 3 の回転速度を検出するとともに、同時にロータリエンコーダ 6 からの Z 相信号からドラム 3

の回転位相を検出する。また、トラバース駆動装置 8 に備えられた図示しないロータリエンコーダからの信号 (トラバース位置信号) に基づき、書込装置 4 の軸方向位置を検出する。そして、これらの検出情報と、検索装置 17 で検索された制御パターンに基づき書込装置 4 の軸方向への移動速度を指示する信号 (トラバース速度指示信号) をトラバース駆動装置 8 に出力する。

【0027】上記の制御パターンは、本実施形態では、書込装置 4 がドラム 3 の軸方向始端側から終端側に進むにつれて版面部 3 A 上での移動速度が基準速度 (ファンアウトがない場合の移動速度) よりも遅い速度から基準速度よりも速い速度に次第に増加していくとともに、版面部 3 A 上におけるドラム 3 の回転周期毎の各書込み開始位置が同一間隔になるように設定されている。この設定は、印刷用紙のファンアウト、特に、枚葉紙のようにくわえ頭側からくわえ尻側にかけて次第に左右幅方向に台形状に広がるようなファンアウトに対応している。

【0028】図 2 は、制御パターンの具体例について示すタイムチャートである。図 2 に示すように、本実施形態では、版面部 3 A と非版面部 (ドラム 3 の外周面から版面部 3 A を除いた、絵柄が書込まれない領域) 3 B との間で書込装置 4 の移動速度の切り替えを行っている。これは、版面部 3 A と非版面部 3 B とで平均すれば基準速度になるように、版面部 3 A での基準速度に対する遅延 (増速) 量に応じて非版面部 3 B の速度を調整するようにしたものである。

【0029】具体的には、軸方向の始端側では、版面部 3 A における移動速度は基準速度よりも低く設定し、非版面部 3 B における移動速度は基準速度よりも高く設定している。そして、軸方向の終端側に進むにつれ、版面部 3 A における移動速度は次第に増加させ、非版面部 3 B における移動速度は版面部 3 A における移動速度と逆比例的に次第に低下させていき、軸方向の中央付近 (版中央付近) において版面部 3 A、非版面部 3 B とともに基準速度に略一致させるとともに、版面部 3 A、非版面部 3 B 間の速度の大小関係を逆転させている。また、版面部 3 A とそれに続く非版面部 3 B との間の速度の関係は、各書込み開始位置 (非版面部 3 B から版面部 3 A へ切替わる位置) 間の距離が等しくなるように、すなわち、図 2 中に示す版面部 3 A での移動速度を示す線と基

準速度線とで囲まれる面積 A1 と、非版面部 3 B での移動速度を示す線と基準速度線とで囲まれる面積 A2 とが等しくなるように設定されている。

【0030】なお、図 2 中における時間軸上での版面部 3 A の長さ (時間長) T1 と非版面部 3 B の長さ (時間長) T2 とは、ドラム 3 の周方向における版面部 3 A、非版面部 3 B のそれぞれの長さ (ドラム 3 の回転周期) とで決まる長さである。例えば、ドラム 3 の周長が 900 mm で、そのうち版面部 3 A が 600 mm であり、ドラム 3 が 300 msec で 1 回転するものとすれば、T1 は 200 msec となり、T2 は 100 msec となる。

【0031】ドラム 3 の回転による主走査と書込装置 4 の移動による副走査とにより、生版 5 の版面部 3 A には絵柄がスパイラル状に斜め方向に書込まれていくが、上記のような制御パターンで書込装置 4 の移動速度を制御することによって、版面部 3 A 上での書込装置 4 の移動軌跡 (絵柄の描画ライン) は図 3 (a) に示すようになる。なお、図中の実線で示す軌跡が、上記のように書込装置 4 の移動速度を制御したときの描画ラインであり、2 点鎖線で示す軌跡は、基準速度で書込装置 4 を移動させたときの描画ラインである。いずれのラインもドラム回転方向に対する角度は斜きをわかり易くするために誇張して示している。

【0032】図 3 (a) に示すように、描画ラインが主走査方向 (ドラム 3 の回転方向) に対してなす角度 α は、軸方向始端側 (描画開始側) では基準速度で書込む時の角度よりも小さく、版面中央付近で基準速度による書込み時の角度と略等しくなり、軸方向終端側 (描画終了側) では基準速度による書込み時の角度よりも大きくなる。これにより、描画ラインの間隔は書込開始位置では基準速度による書込み時と等しいものの、くわえ尻側にかけて次第に広がっていく。このため、版面部 3 A に描画される絵柄は、図 3 (b) に示すように、印刷用紙のファンアウトと同様に、くわえ頭側からくわえ尻側にかけて次第に左右幅方向に台形状に拡大されることになる。なお、図中の 2 点鎖線で示す領域は、基準速度で書込装置 4 を移動させたときの絵柄の描画領域を示し、実線で示す領域が、上記のように書込装置 4 の移動速度を制御したときの絵柄の描画領域を示している。

【0033】本実施形態では、上記のような制御パターンを印刷条件毎に用意してデータベース 18 に記憶している。印刷条件とは、紙種や印圧その他の印刷用紙のファンアウトに影響する条件である。また、版が装着される印刷ステーションの印刷ライン上での位置もこの印刷条件に含まれる。例えば、伸びやすい紙と伸びにくい紙とでは、伸びやすい紙のほうがファンアウトは大きいので、伸びやすい紙ほど絵柄が左右幅方向に広がるような制御パターンとする。また、印刷ステーションの位置については、下流の印刷ステーションほどファンアウト

が大きくなるので、下流の印刷ステーションほど絵柄が左右幅方向に広がるような制御パターンとする。具体的には、軸方向始端側及び軸方向終端側における基準速度（版中央付近の速度）に対する書込装置4の移動速度の速度偏差を大きく設定する。

【0034】また、データベース18には、制御パターンとともに印刷条件に応じた変換係数の値も記憶されている。この変換係数は、エンコード周波数-描画周波数変換装置15での周波数変換に用いられる係数であり、変換係数の大きさに応じて書込装置4による描画速度が変化することになる。例えば、変換係数が小さいほど描画速度が遅くなって、図4(a)に示すように生版5上での描画ラインは縦方向（ドラム3の周方向）に拡大されることになる。なお、図中の2点鎖線で示す軌跡は、変換係数を基準値に設定した場合の描画ラインであり、実線で示す軌跡は、変換係数を基準値よりも小さく設定した場合の描画ラインである。

【0035】印刷用紙のファンアウトは左右幅方向のみならず、縦方向にも生じるので、このように印刷条件に応じて変換係数を可変設定することで、図4(b)に示すように縦方向へのファンアウトにも対応させて絵柄を変形させることが可能になる。なお、図中の2点鎖線で示す領域は、変換係数を基準値に設定した場合の絵柄の描画領域を示し、実線で示す領域が、上記のように変換係数を基準値よりも小さく設定した場合の絵柄の描画領域を示している。

【0036】絵柄が周方向に拡大されると、ドラム3の周方向における版面部3Aと非版面部3Bとの割合が変化する。そこで、本実施形態では、この版面部3Aと非版面部3Bとの割合の変化を考慮して図2中における時間軸上での版面部3Aの長さT1と非版面部3Bの長さT2との関係の設定を変換係数の大小に同期させている。すなわち、トラバーサ2による書込装置4の移動速度を、書込装置4の書込速度に同期させて制御している。具体的には、変換係数が小さくなるほど版面部3Aがドラム3の周方向に伸張されるので、版面部3Aが伸びた分だけT1を長く設定し、逆にその分だけT2を短く設定する。

【0037】検索装置17では、上記のデータベース18から印刷条件に合致した制御パターン及び変換係数を検索する。検索した制御パターンはトラバーサ速度指示装置16に入力され、変換係数は変換係数指示装置19に入力される。なお、印刷条件は、図示しない入力装置を介して入力される。この入力装置は、キーボード等のオペレータが手入力で入力するものでもよく、下流の印刷工程からオンラインで入力するものでもよい。

【0038】以上のように書込装置4によるレーザ照射のタイミング及びトラバーサ2による書込装置4の移動速度が制御されることにより、本実施形態にかかる製版装置によれば、ドラム3上の版面部3Aに、くわえ頭側

からくわえ尻側にかけて次第に左右幅方向に台形状に拡大された絵柄を描画することができる。また、同時に縦方向にも拡大された絵柄を描画することもできる。そして、これらの拡大変形量は、制御パターンや変換係数の設定により、印刷条件に応じて任意に設定することができる。

【0039】したがって、本実施形態にかかる製版装置によれば、従来のようにファンアウト万力を用いることなく、印刷用紙のファンアウトに対応させて容易に色間見当を合わせることで印刷用版を得ることが可能になる。なお、本実施形態にかかる制御方式では、厳密にはくわえ頭側とくわえ尻側とでドットの間隔が一部で異なるが、その量は十分に小さく、問題にならない程度である（例えばドラム3の左右幅を900mm、広げ量を200μとすれば、ドラム3の1回転毎の描画絵柄の間隔は、 $(200\mu\text{mm} \div 10\text{mm/sec} \div 300\text{ms}) = 0.7\mu$ となる）。

【0040】次に、本発明の第2実施形態について図5、図6を用いて説明する。なお、本実施形態にかかる製版装置は、図1に示す第1実施形態にかかる製版装置と同一構成であるので、以下、第1実施形態と同一の符号を用いて説明する。第2実施形態は、トラバーサ2による書込装置4の移動速度の制御方法、すなわち、制御パターンのみが第1実施形態と異なっている。ここで、図5は、本実施形態にかかる制御パターンの一例を示すタイムチャートであり、図6は図5の制御パターンによる絵柄の書込み状態を示す図である。

【0041】本実施形態は、書込装置4の移動速度の切り替えを行わないことによって、第1実施形態よりもトラバーサ2の速度制御を簡略化したものである。すなわち、図5に示すように、本実施形態では、書込装置4の移動速度を基準速度よりも大きく設定し、描画開始から描画開始まで書込装置4の移動速度を変化させることなく、設定した速度で定速移動させている。なお、書込装置4の移動速度の基準速度に対する増分は、後述するように印刷条件に応じて設定されている。また、軸方向の描画開始位置は、絵柄中央が版面部3Aの中央に一致するように移動速度に応じて設定されている。

【0042】上記のような制御パターンで書込装置4の移動速度を制御することによって、版面部3A上での書込装置4の移動軌跡（絵柄の描画ライン）は図6(a)に示すようになる。なお、図中の実線で示す軌跡が、上記のように書込装置4の移動速度を制御したときの描画ラインであり、2点鎖線で示す軌跡は、基準速度で書込装置4を移動させたときの描画ラインである。

【0043】図6(a)に示すように、描画ラインが主走査方向（ドラム3の回転方向）に対してなす角度αは、書込装置4の移動速度が基準速度よりも大きく設定されることによって、基準速度で書込む時の角度よりも大きくなる。これにより、描画ラインの間隔は基準速度

で書込む時よりも広がる。このため、版面部 3 A に描画される絵柄は、図 6 (b) に示すように、左右幅方向に一樣に拡大されることになる。なお、図中の 2 点鎖線で示す領域は、基準速度で書込装置 4 を移動させたときの絵柄の描画領域を示し、実線で示す領域が、上記のように書込装置 4 の移動速度を制御したときの絵柄の描画領域を示している。

【0044】本実施形態でも、上記の制御パターンは印刷条件毎に用意されてデータベース 18 に記憶されている。例えば、ファンアウトが大きい印刷条件に対応する制御パターンは、ファンアウトが小さい印刷条件に対応する制御パターンよりも、左右幅方向への拡大率が大きくなるように、移動速度の基準速度に対する増分を大きく設定されている。また、軸方向の描画開始位置も、絵柄中央が版面部 3 A の中央に一致するように制御パターンに応じて印刷条件毎に設定されている。

【0045】さらに、第 1 実施形態と同様に、データベース 18 には制御パターンとともに印刷条件に応じた変換係数（エンコーダ周波数の描画周波数への周波数変換に用いられる係数）の値も印刷条件毎に記憶されている。そして、トラバサ 2 による書込装置 4 の移動速度とともに、変換係数の大きさに応じて書込装置 4 による描画速度も可変制御されるようになっている。なお、描画速度が遅くなるほど絵柄は縦方向（ドラム 3 の周方向）へ拡大されるが、本実施形態でも、絵柄の周方向への拡大による版面部 3 A と非版面部 3 B との割合の変化を考慮して、トラバサ 2 による書込装置 4 の移動速度を、書込装置 4 の書込速度に同期させて制御している。

【0046】以上のように、本実施形態にかかる製版装置によれば、ドラム 3 上の版面部 3 A に、見本絵柄に対して左右幅方向に一樣に拡大された絵柄を描画することができる。また、同時に縦方向にも拡大された絵柄を描画することもできる。そして、これらの拡大変形量は、制御パターンや変換係数の設定により、印刷条件に応じて任意に設定することができる。

【0047】したがって、本実施形態にかかる製版装置によっても、従来のようにファンアウト万力を用いることなく、印刷用紙のファンアウトに対応させて容易に色間見当を合わせることもできる印刷用版を得ることが可能になる。また、本実施形態によれば、第 1 実施形態よりも簡単な制御によって印刷用紙のファンアウトに対応することができるという利点がある。特に、枚葉印刷機で印刷される枚葉紙のファンアウトのように、くわえ頭側からくわえ尻側にかけて台形状に変形するようなファンアウトに対しては、第 1 実施形態の制御パターンにより製版される印刷用版が好適であるが、例えば輪転機で印刷される新聞用紙のファンアウトのように、左右幅方向へ略均一に伸びるようなファンアウトに対しては、本実施形態の制御パターンにより製版される印刷用版が好適である。

【0048】以上、本発明の 2 つの実施形態について説明したが、本発明は上述の実施形態に限定されるものではなく、本発明の趣旨を逸脱しない範囲で種々変形して実施することができることは言うまでもない。上述の実施形態にかかる製版装置の構成によれば、書込装置 4 の移動速度をドラム 3 の回転位相や書込装置 4 の軸方向位置に応じて任意に制御することができる。したがって、書込装置 4 の移動速度を制御する制御パターンは、上述の各実施形態のものに限定されるものではなく、印刷用紙のファンアウトの状態に応じて任意の制御パターンを設定することが可能である。

【0049】一例を挙げると、図 7 に示すような制御パターンで書込装置 4 の移動速度を制御することも可能である。具体的には、書込装置 4 がドラム 3 の軸方向始端の描画開始位置から版面部 3 A の中央付近に進むにつれて書込装置 4 の移動速度を次第に増加させ、版面部 3 A の中央において最高移動速度とする。そして、版面部 3 A の中央から軸方向終端の描画終了位置に進むにつれて書込装置 4 の移動速度を次第に低下させていく。ここでは、軸方向の速度分布を版面部 3 A の中央に対して軸方向始端側と終端側とで対称にしておき、且つ、描画開始位置付近及び描画終了位置付近における移動速度を基準速度に略一致させている。また、軸方向の描画開始位置は、絵柄中央が版面部 3 A の中央に一致するように設定されている。

【0050】上記のような制御パターンで書込装置 4 の移動速度を制御することによって、版面部 3 A 上での書込装置 4 の移動軌跡（絵柄の描画ライン）は図 8 (a) に示すようになる。なお、図中の実線で示す軌跡が、上記のように書込装置 4 の移動速度を制御したときの描画ラインであり、2 点鎖線で示す軌跡は、基準速度で書込装置 4 を移動させたときの描画ラインである。

【0051】図 8 (a) に示すように、描画ラインが主走査方向（ドラム 3 の回転方向）に対してなす角度 α は、軸方向始端では基準速度で書込む時の角度に等しく、版面中央付近で最も大きくなり、軸方向終端において再び基準速度で書込む時の角度に等しくなる。これにより、描画ラインの間隔は軸方向始端から版面中央にかけて次第に広がっていき、版面中央から軸方向終端にかけて再び狭まっていく。また、この場合、版面部 3 A の縦方向（ドラム 3 の周方向）における描画ラインの間隔は略等しい。

【0052】このため、版面部 3 A に描画される絵柄は、図 8 (b) に示すように、左右幅方向に、特に絵柄中央部において左右幅方向に拡大されることになる。この場合も書込装置 4 の移動速度は印刷条件に対応して設定され、ファンアウトが大きい印刷条件に対しては、ファンアウトが小さい印刷条件よりも左右幅方向への拡大率が大きくなるように、版中央付近の移動速度が大きく設定される。なお、図中の 2 点鎖線で示す領域は、基準

速度で書込装置 4 を移動させたときの絵柄の描画領域を示し、実線で示す領域が、上記のように書込装置 4 の移動速度を制御したときの絵柄の描画領域を示している。

【0053】また、上述の実施形態にかかる製版装置では、変換係数指示装置 19 によりエンコーダ周波数を描画周波数に変換する際の変換係数を可変設定しているが、この変換係数を書込装置 4 の軸方向位置に応じて可変設定できるようにしてもよい。この場合、書込装置 4 の軸方向位置に応じた変換係数の設定パターン（制御パターン）を印刷条件毎に予め容易してデータベース 18 に記憶しておくとともに、トラバース駆動装置 8 のロータリエンコーダからのトラバース位置信号を変換係数指示装置 19 に入力可能に構成する。そして、検索装置 17 で検索された設定パターンとトラバース位置信号とに基づき変換係数の設定値を取得してエンコーダ周波数—描画周波数変換装置 15 に出力する。これにより、書込装置 4 による描画速度をドラム 3 の軸方向位置に応じて変化させることが可能になる。

【0054】さらに、ロータリエンコーダ 6 からの A、B、Z 相信号を変換係数指示装置 19 に入力して、ドラム 3 の回転位相に応じて変換係数を可変設定できるようにしてもよい。この場合も、ドラム 3 の回転位相に応じた変換係数の設定パターン（制御パターン）を印刷条件毎に予め容易してデータベース 18 に記憶しておくのが好ましい。これにより、書込装置 4 による描画速度をドラム 3 の回転位相に応じて変化させることが可能になる。さらに、上述の実施形態のように書込装置 4 による描画速度を可変にするのではなく、ドラム 3 の回転速度を印刷条件に応じて可変制御してもよい。これによっても、絵柄を縦方向に変形させることができる。なお、この場合はドラム 3 の回転速度に応じて書込装置 4 の移動速度を制御する。さらに、書込装置 4 の描画速度と、ドラム 3 の回転速度とをともに印刷条件に応じて可変制御することも可能である。

【0055】さらに、上述の実施形態では、本発明を専用の製版装置に適用した場合について説明したが、本発明は、製版装置を内部の一機能として取り込んだ機上製版印刷機にも適用することができる。機上製版印刷機は、版胴（ドラム）の外周面上に生版を装着して絵柄を書込む形式の他、版胴の外周面に直接絵柄を書込む形式もあり、本発明はその何れにも適用することができる。また、絵柄の書込み方式は、上述の実施形態のよう感光性の版面部をレーザ光線等の光線により露光して絵柄パターンを書込む方式に限定されるものではなく、インクジェットのように版面部に版材の滴を付着させて絵柄パターンを書込む方式等、印刷用版の作成方式に応じて種々の書込み方式を用いることができる。

【0056】

【発明の効果】以上詳述したように、本発明の製版装置（第 1 の製版装置）によればドラムの回転速度に対する

書込装置の移動速度を、印刷条件に応じて制御することにより、版面部に見本絵柄に対して左右幅方向に変形させた絵柄を描画することができるので、印刷用紙のファンアウトに対応させて容易に色間見当を合わせることのできる印刷用版を得ることが可能になる。特に、データベースに書込装置の移動速度の制御パターンを印刷用紙の幅方向のファンアウトに応じて印刷条件毎に記憶しておき、このデータベースから検索された制御パターンに基づき書込装置の移動速度を制御することにより、印刷条件に応じた印刷用版を容易に得ることが可能になる。

【0057】また、本発明の別の製版装置（第 2 の製版装置）によれば、ドラムの回転速度に対する書込装置の書込速度を印刷条件に応じて制御するとともに、書込装置の書込速度に同期させてドラムの回転速度に対する書込装置の移動速度を制御することにより、版面部に見本絵柄に対して縦方向に変形させた絵柄を描画することができるので、印刷用紙のファンアウトに対応させて容易に色間見当を合わせることのできる印刷用版を得ることが可能になる。

【0058】特に、データベースに書込装置の書込速度の制御パターンを印刷用紙の縦方向のファンアウトに応じて印刷条件毎に記憶しておき、このデータベースから検索された制御パターンに基づき書込装置の書込速度を制御することにより、印刷条件に応じた印刷用版を容易に得ることが可能になる。

【図面の簡単な説明】

【図 1】本発明の第 1 実施形態にかかる製版装置の構成を示す機能ブロック図である。

【図 2】本発明の第 1 実施形態にかかる書込装置の軸方向移動速度の制御パターンを示すタイムチャートである。

【図 3】図 2 の制御パターンによる絵柄の書込み状態を示す図であり、（a）は生版上での描画ラインを示す図、（b）は絵柄の描画領域を示す図である。

【図 4】図 3 においてさらに書込速度を変化させたときの絵柄の書込み状態を示す図であり、（a）は生版上での描画ラインを示す図、（b）は絵柄の描画領域を示す図である。

【図 5】本発明の第 2 実施形態にかかる書込装置の軸方向移動速度の制御パターンを示すタイムチャートである。

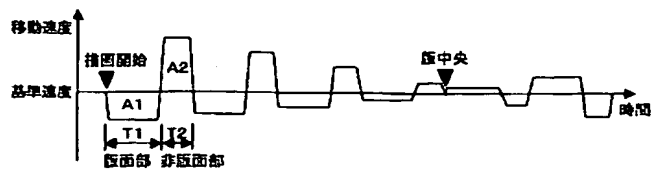
【図 6】図 5 の制御パターンによる絵柄の書込み状態を示す図であり、（a）は生版上での描画ラインを示す図、（b）は絵柄の描画領域を示す図である。

【図 7】書込装置の軸方向移動速度の制御パターンの変形例を示すタイムチャートである。

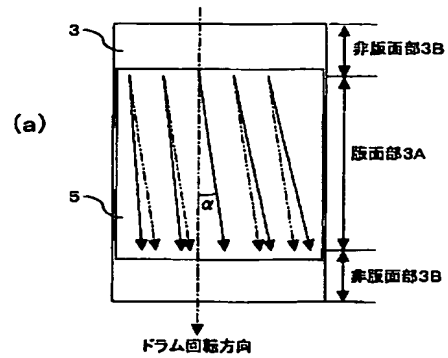
【図 8】図 7 の制御パターンによる絵柄の書込み状態を示す図であり、（a）は生版上での描画ラインを示す図、（b）は絵柄の描画領域を示す図である。

【図 9】（a）は従来の一般的な外面ドラム方式の製版

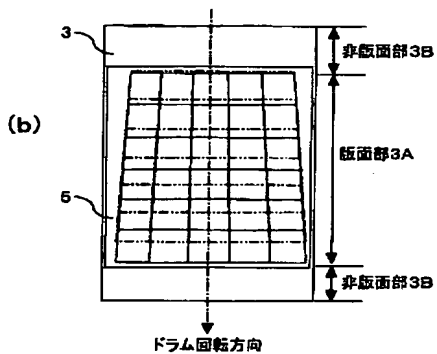
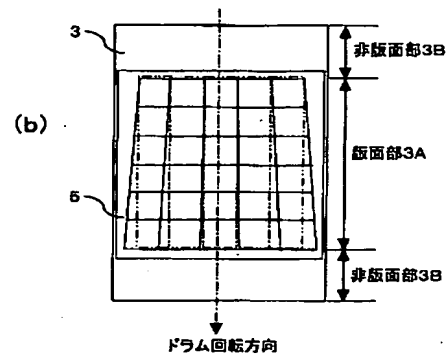
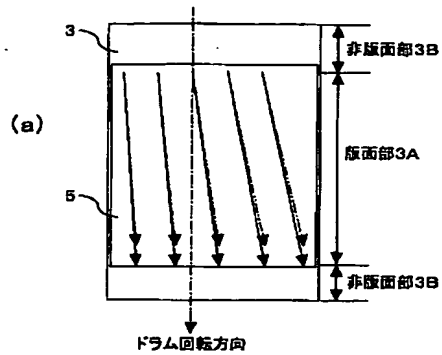
【図 2】



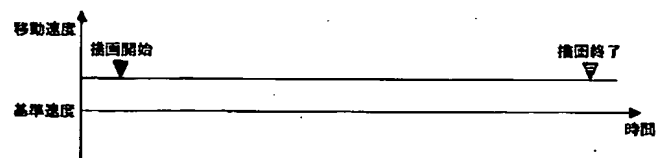
【図 3】



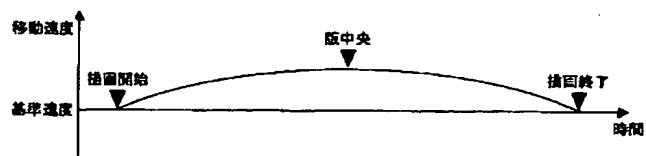
【図 4】



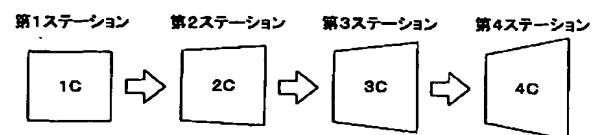
【図 5】



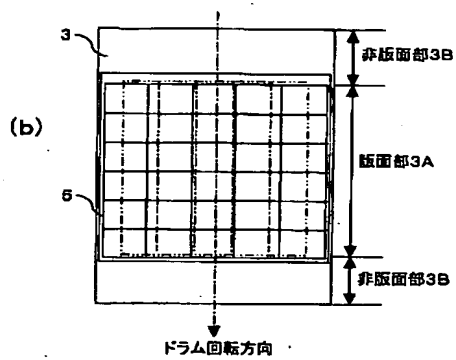
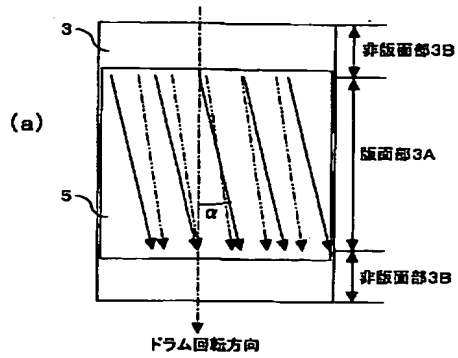
【図 7】



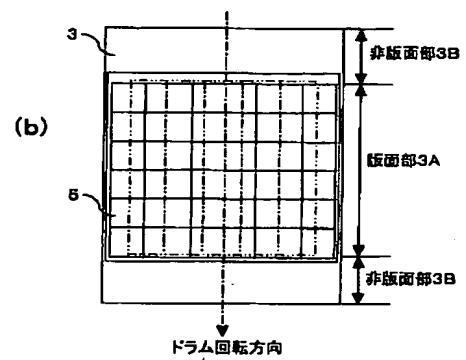
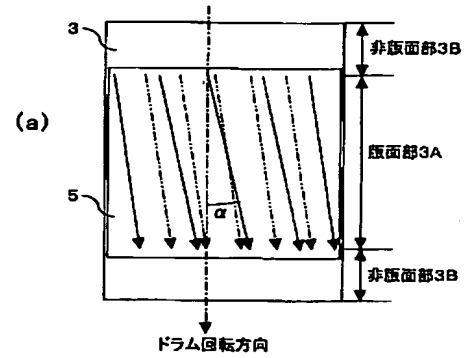
【図 10】



【図 6】



【図 8】



【図 9】

